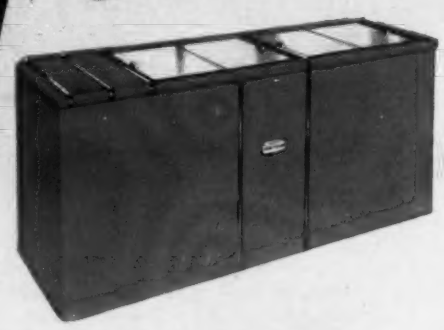
• **MODEL F**—Three storage compartments on top for WET or DRY storage—a model with a capacity of approximately 14 cu. ft. in the three top compartments. (This model has no separate side-door compartment.)



• **MODEL D**—An extra-capacity table-top refrigerator with two storage compartments on top for WET or DRY storage, plus the additional advantage of a side-door storage compartment. The two top compartments and the side-door compartment have a combined capacity of approximately 13 cu. ft.

• **MODEL B**—For smaller space, this table-top model meets every need. Its single top compartment can be used WET or DRY. In addition, it has a side-door dry storage compartment. The top and side-door compartments have a combined capacity of approximately 9 cu. ft.

TWO REFRIGERATORS IN ONE . . . WET OR DRY STORAGE

Models B and D have a special 5⅓ cu. ft. side-door dry storage compartment for storing meats, foods and prepared dishes. This compartment has a capacity, practically the equivalent of a household refrigerator.

• Separate compartments on top may be used WET or DRY.

The 1938 BRUNSWICK DISTRIBUTOR — DEALER FRANCHISE OFFERS *New Source of* SALES AND PROFITS

HERE'S THE STORY—Brunswick offers to established appliance distributors and dealers a new and proven idea in commercial refrigeration—which opens a tremendous new source of sales and profits! Every retail merchant in your town who serves or sells foods or beverages is a potential buyer of a BLUE FLASH Table-Top Electric Refrigerator! For, the BLUE FLASH is actually "two refrigerators in one," and provides both WET or DRY storage at the lowest cost per cubic foot of any refrigerator.

HERE'S THE PROOF—Through forty Brunswick retail branch offices, and a few test points in the regular trade channels, thousands of BLUE FLASH Refrigerators were sold.

From one city alone, five thousand Brunswick BLUE FLASH orders were received! Sales during four months of 1937 exceeded the total volume for the whole year of 1936! This is substantial evidence that retailers in your territory will recognize the value of BLUE FLASH Refrigerators and BUY.

HERE'S THE MARKET—Check this list. The Brunswick BLUE FLASH is making profits daily for owners of all these types of business. In the United States, 1,064,000 of them do a total volume of Twelve Billion Dollars annually. How many are in your territory?

CAFES	THEATRES	NURSERIES
FRATERNITY HOUSES	SODA FOUNTAINS	BEVERAGE DISPENSERS
SERVICE STATIONS	CLINICS	FRUIT STORES
CANDY STORES	OFFICE BUILDINGS	COMMISSARIES
DELICATESSENS	SCHOOLS	BARBER SHOPS
TAVERNS	BAKERIES	LABORATORIES
MEAT MARKETS	DEPARTMENT STORES	LIQUOR STORES
COUNTRY CLUBS	GROCERIES	ROAD HOUSES
HOTELS	CHURCH HALLS	CAFETERIAS
BOATS	AMUSEMENT RESORTS	LAUNDRIES
BOWLING ALLEYS	HOSPITALS	CREAMERIES
CLUBS	ICE CREAM MFRS.	CANDY MANUFACTURERS
RAILROAD STATIONS	BARBECUES	BREWERIES
GARAGES	DRUG STORES	FISH MARKETS
BEAUTY PARLORS	FACTORIES	NEWS STANDS
BEVERAGE BOTTLERS	RESTAURANTS	DINERS

HERE'S WHAT—The immediate and enthusiastic acceptance of the BLUE FLASH by retailers was due not only to the fact that it keeps virtually all foods and beverages perfectly refrigerated, but also because it is a real merchandising refrigerator. Because of its table-top construction, merchants use it as a table, as a counter, or as an island display. It sells foods and beverages, and it saves shelf space.

HERE'S WHY—Three BLUE FLASH models meet the needs of the smallest or the largest retailers. Backed by nearly a century of manufacturing and engineering experience, the BLUE FLASH offers your customers the utmost in appearance, convenience, efficiency, economy and durability. Because of its five-sided refrigeration, you can slide the top and reach in . . . and the cold stays in—even when the top is open. Every BLUE FLASH is "torture tested" in tropical temperature and humidity and a certification of actual performance accompanies every refrigerator shipped to the trade.

HERE'S HOW—A dramatic, illustrated sales presentation, all in one portfolio, makes selling easier for your salesmen. A convincing and effective sales promotion plan, new selling ideas, and a new finance plan, furnish powerful selling ammunition for your organization.

GET YOUR SHARE OF THIS CREAM

Full particulars relative to prices, discounts, floor plan, franchise agreement, complete finance plan and other pertinent facts, will be furnished to established distributors or dealers upon request. Address Appliance Division, The Brunswick-Balke-Collender Co., Dept. 221—629 South Wabash Avenue, Chicago, Ill.

APPLIANCE DIVISION

THE BRUNSWICK-BALKE-COLLENDER COMPANY

(Dept. 221) 629 SOUTH WABASH AVENUE • CHICAGO, ILLINOIS

Brunswick **BLUE FLASH**

TABLE-TOP ELECTRIC REFRIGERATOR

Air Conditioning & Refrigeration News

The Newspaper of the Industry

Trade Mark Registered U. S. Patent Office. Established 1926 as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.

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IN TWO PARTS, PART ONE
TWENTY CENTS PER COPY

More Specialty Selling Activity Urged Upon Department Stores

Advertising of Warranties Subject of Attack By Retailers

NEW YORK CITY—Teamwork in selling major household appliances, long a favorite topic of discussion between manufacturers and department stores, can be achieved—but not without considerable changes in practices on the part of both factors, it was brought out in discussions at last Thursday's merchandising session of the National Retail Dry Goods Association, at which current appliance selling problems were aired.

Most of the old problems discussed in previous manufacturer-department store meetings came back home to roost: the question of private brands, profit margins, competitive practices between dealers and department stores, five-year warranties and methods used in advertising them, time payment terms, and cold canvassing versus outside follow-up on store leads only.

In the give-and-take discussion following talks on "Getting Teamwork Between Manufacturers and Department Stores in the Merchandising of Major Household Appliances" by Ralph C. Cameron, Kelvinator household appliance sales

(Concluded on Page 2, Column 1)

Distributors Protest N. Y. Licensing Bill On Air Conditioning

BUFFALO—Senate Bill 174, an act for licensing air-conditioning work in New York state, has been protested by the Western New York Air Conditioning Council on the grounds that, as it stands, the bill places too much authority in the hands of the local union of pipefitters and plumbers, and practically excludes refrigeration and air-conditioning men from control of their own industry, according to Roswell Farnham, council president.

Dawes Appointed Mills Eastern Manager

CHICAGO—B. B. Dawes has been appointed eastern manager of the commercial refrigeration division of Mills Novelty Co., reports Ray Polley, division manager.

His territory will include New York City, Philadelphia, Baltimore, and Washington, D. C. Mr. Dawes formerly was manager of the refrigeration and air-conditioning division of the H. Channon Co., Chicago, parts and supplies jobber.

Frigidaire Leading 1937 Advertiser Of Refrigerators

NEW YORK CITY — Fourteen leading manufacturers of household mechanical refrigerators and other major home appliances spent $3,015,836 in advertising their products in national magazines during 1937, according to Publishers' Information Bureau figures.

Included in this total, in addition to household refrigerators, are manufacturers' expenditures for "combination" advertising, in which refrigerators are featured along with other home appliances such as ranges, laundry equipment, dishwashers, and waste disposal units. Also covered are magazine advertisements covering consumer contests.

Leading the list of home appliance advertisers last year, according to P.I.B. compilations, was Frigidaire division, General Motors Corp., which spent $627,570 in 19 magazines. Of this amount, $108,000 was spent in The American Weekly, and $98,300 in Saturday Evening Post.

Norge division, Borg-Warner Corp., spent $518,450 in four publications to rank second on the list. Major share of this amount was divided between American Weekly, with $274,000, and This Week, with $166,650. Saturday Evening Post and Good Housekeeping were the other publications used.

Westinghouse Electric & Mfg. Co., with an expenditure of $452,460, ranked third on the national magazine advertising list. Eleven publications were used by the company, including Saturday Evening Post, American Weekly, This Week, Collier's, Ladies' Home Journal, McCall's, and Good Housekeping.

Servel, Inc., spent $436,575 in

(Concluded on Page 24, Column 3)

Dealers at President's Meeting Ask Hands Off Instalment Selling

S-W Distributor in N.Y. Offers $5,000 Price Control Fund

BROOKLYN—A $5,000 fund was placed in care of the Electrical Appliance Dealers Association of Brooklyn last week by Wholesale Radio Equipment Co., Stewart-Warner distributor for greater New York, to be used for enforcement of a Feld-Crawford contract issued by the distributor, according to an announcement by Percy Peters, chairman of the Feld-Crawford committee for the association.

Mr. Peters stated that the donation represents the "first real attempt to control prices" in this territory. He said that immediately following its announcement, 40 Brooklyn dealers who previously had not handled Stewart-Warner refrigerators placed orders with Wholesale Radio for a minimum of three 1938 models each.

A judicial committee, composed of selected dealers and two "disinterested" persons, will be set up within the association to hear evidence pertaining to alleged violations of the contract, and make decisions in such cases.

The distributor will employ two

(Concluded on Page 24, Column 4)

Tell Roosevelt It Will Be Means for Return of Mass Purchasing

WASHINGTON, D. C.—Although the antics of a few headline makers and sideshow performers got the major share of attention from the press at the Conference of Representatives of Smaller Businesses at the Department of Commerce Feb. 2 and 3, the main group, working in well-organized sections, found little difficulty in agreeing upon a constructive program for small business.

The committee on instalment selling, consisting of household appliance dealers, retail automobile dealers, and finance company representatives, strongly advised that the administration refrain from engaging either directly or indirectly in the business of instalment financing.

Recommendations made to the President by this group were:

1. Instalment selling is sound and is considered responsible for an important part in the recovery movement.

2. When confidence is restored, instalment selling will be a means of restoring mass purchasing power.

3. Terms and down payments

(Concluded on Page 11, Column 1)

Dealer Seeks Out Owners of Beautiful Bathrooms as Best Kitchen Prospects

ALAMEDA, Calif.—Look for the home with a beautiful, modern bathroom. Then convince its owner that the kitchen is twice as important in the life of the average family as is the bath. That's the way to sell all-electric kitchens, according to John M. Ansel, head of Ansel's Electric Co., one of this city's most successful refrigerator and appliance dealers.

In this island city of 40,000 population, separated from Oakland only by a narrow tidal channel and from San Francisco only by the length of the Bay Bridge, Mr. Ansel has sold 1,100 electric refrigerators in the last 10 years.

Now he's concentrating on the sale of all-electric kitchens to owners of that equipment. Already he has sold partial or complete kitchen modernization to about 10% of those old customers. In the past year his volume has shown a gain of over 25%.

Mr. Ansel's record, particularly in view of the difficult merchandising conditions under which he operates, is worthy of attention. A large percentage of the city's residents are commuters, who work in Oakland or San Francisco.

In many cases, it's actually easier for them to buy in the city, where they work, than at home. Yet, through an unusually complete service and the consistent promotion of one exclusive line of refrigerators—General Electric—Mr. Ansel has developed an outstanding business.

"The dealer who must depend on repeat business from the home trade can't afford to change lines," says he. "Our year-after-year appeal on just one good refrigerator is the thing that's built our business."

Mr. Ansel's success in developing follow-up business on all-electric kitchens is the result of efficient service and careful cultivation work. The company is in constant contact with every old customer.

On its staff is one refrigeration service specialist, a radio and appliance repair expert, and a general "handy man" who can make kitchen installations, do wiring, or just about anything else that might be required.

(Concluded on Page 4, Column 1)

Hope Grows for Lifting Of Australian Import Ban

SYDNEY, Australia—The feeling is growing on the part of refrigeration interests here that as a result of trade negotiations being carried on between Great Britain and the United States, the existing prohibition against the import of goods from the United States will be lifted.

At the present time, it is possible for refrigeration manufacturers, suppliers, and distributors to import only those items which are not manufactured in Australia.

Australian suppliers are said to be desirous of obtaining current catalog and price information, since they have been out of touch with U. S. manufacturers of many items for some time.

'Dishonest Collateral' is Basic Credit Selling Abuse Which Needs Correction, Gillis Says

DETROIT—The practice of some dealers and finance companies in setting up a "dishonest collateral" on goods which is to be sold on time payments is a basic abuse which must be curbed, if instalment financing is to continue to play its proper role in the nation's business picture.

The dealer who sells a $150 radio or electrical appliance to a customer who hasn't enough cash to meet the down payment has no reason in the world to expect that a purchaser of this sort will be able to meet his monthly payments on time.

Present Michigan law offers two remedies, repossession and deficiency judgment, which are too liable to misuse by dealers or finance companies who want to "have their cake and eat it, too"—the unscrupulous operator can reposses the goods, sell it to a third party for little or nothing under a pre-arranged plan, buy it back himself at a profit, and still obtain a deficiency judgment against the original purchaser in excess of current value of the merchandise.

These are the opinions of Judge Joseph A. Gillis, the result of his experience in handling more than 60,000 cases in his conciliation division of Wayne County's Common Pleas Court here.

"Dishonest collateral" is the term Judge Gillis uses to describe the practice of some dealers in setting a sales price much higher than the actual market value of the merchandise at the time of sale, when the article is to be sold on time payments. This is done most extensively in the selling of used cars, but may also be applied to appliances and other household goods.

In the event of repossession, the owner is required to pay the difference between the "quick cash" value of the goods and the balance due on the time sales contract. This balance often amounts to more than the real market value of the article when it was originally sold, Judge Gillis points out.

In cases where a down payment of 25 or 30% is required, the dealer

(Concluded on Page 23, Column 3)

Serious and Comic Moments from Frigidaire's Road Show of Its 1938 Program

Dealers from Atlanta, New York City, Richmond, Boston, St. Louis, and other centers have witnessed the scenes from Frigidaire's "road show" as shown above, and they will serve as a preview for dealers in other cities who have yet to see them.

(1) C. A. Hughes, who portrays Thomas A. Edison, in one of the scenes depicting the advances of science, carefully explains a new invention to J. A. Mitzelfelt. (2) It was practically a "strong arm" sale when the boys working late at the sales office sold the janitor a Frigidaire. The scene is from one of the humorous skits presented by Don Lyons, W. F. Switzer, William Miller, R. L. Winegarner, and A. D. Farrell. (3) Features of the Frigidaire ranges, refrigerators, and washers are poured simultaneously upon the ears of "salesman" H. T. Shannon, from the lips of the "super salesmen" S. V. White, C. J. Allen, and Ralph Rodkey, in a scene from the skit titled "Phantasmagoria." (4) H. M. Kelley as "Louis Pasteur," in one of the more serious scenes in the show.

Means of Getting Department Stores into Specialty Selling Discussed at Meeting

(Concluded from Page 1, Column 1)

manager, and R. C. Cosgrove, Westinghouse's manager of household refrigeration sales, the questions of private brand merchandising and advertising of warranties came in for a major share of attention.

Private brand merchandising was criticized by Mr. Cameron, who said that "the advantages are overwhelmingly with the promotion of a nationally advertised product." Department store men, however, defended the practice on the grounds that price-cutting by dealers and other competitive conditions made their use almost imperative.

Retailers criticized the five-year warranty as being misleading to the average customer, and said that manufacturers place too much emphasis on this point in their advertising. In reply, Mr. Cameron defended the five-year warranty on sealed units as a necessary protection to the purchaser, and Mr. Cosgrove offered to present the subject of advertising over-emphasis to members of National Electrical Manufacturers Association at their mid-winter meeting here this week.

Mr. Cosgrove said his proposal to Nema members would be made on condition that manufacturers of refrigerators might refuse participation in department store advertising costs, if the stores refuse to use the advertising copy supplied by manufacturers.

Other speakers at the appliance merchandising session were Carl Snyder, appliance sales manager of General Electric Co., and George Stevens, major appliance manager of Allied Stores Corp., New York City. Herschel Lutes, divisional merchandise manager of J. L. Hudson Co., Detroit, was chairman.

Cameron Talks About 'Brand' Merchandising

Merchandising problems of household appliance departments can be solved through the close cooperation of manufacturer and department store in specialty selling activities, and a carefully integrated sales program, Mr. Cameron told N.R.D.G.A. members.

"A great many department stores which are not making a profit from major appliance sales," he declared, "have the feeling that major appliances are not specialties and do not need specialty selling. The fact is that they are specialties and must always be sold by these methods—by trained salesmen, by demonstrations, and by advertising."

These activities, Mr. Cameron stated, should be conducted with the close cooperation of the manufacturer.

"Appliance manufacturers," he said, "realize fully the value of the department store to them, both as a source of direct sales and for the prestige of the store's name. For this reason, the manufacturer is doing his utmost to solve the problems of retail distribution for his product."

In his talk, Mr. Cameron said, he voiced the opinion of America's leading department store executives as to the specific methods which should be adopted to make the appliance business more pleasant and more profitable for the department store. The viewpoint of some 100 of these executives was expressed to him in response to an inquiry made by Nash-Kelvinator last month, he declared.

"The department store's problems of merchandising are more difficult," Mr. Cameron said, "being each dependent on a particular local problem.

"A systematic inquiry into these problems shows that competition and price-cutting are the greatest.

"As remedies, appliance manufacturers urge the following measures: elimination of unfair trade practices; continuing reduction of prices on models, taking over of installation, service, and warehousing by distributors; contact between manufacturers' field workers and retail salespeople; special department store promotion work by manufacturers; supplementing refrigerator manufacture with a full line of household appliances so as to defeat seasonal merchandising irregularities.

"In regard to selling nationally advertised products as against private brand merchandising, the advantages are overwhelmingly with the promotion of a nationally advertised product. With such products the department store can look to the manufacturer to protect the reputation of the product by careful manufacture, use of quality materials, service, and warranty or guaranties.

"Furthermore, the store takes advantage of consumer goodwill already established, public confidence built through national advertising, and widespread knowledge of the product features and their advantages. Warehousing and service facilities are also available on nationally advertised products, thus permitting the store to avoid heavy inventories and take profits on the basis of quick turnover. Responsibility for servicing is shared with the manufacturer, thus ensuring better goodwill for the store."

Cosgrove Scores Stores for Pre-Christmas Inactivity

If teamwork between appliance manufacturers and department stores had been as effective as it might be, these stores would now be doing more than the 15 or 20% of all major appliance business which they get at present, Mr. Cosgrove said in his talk to N.R.D.G.A. members.

Suggestions which he made for improving the present situation included:

The local situation should be considered more important, to department stores, than the national one.

Closer relationships should be established between department stores and appliance distributors, so that the two can pull together for more business.

Stores' efforts should be planned so that the distributor can work in cooperation with them.

As one example of department stores' failure to cooperate with manufacturers, Mr. Cosgrove said that the stores had not been active in promoting refrigerator sales before and during the Christmas buying season. Manufacturers, he declared, had arranged announcements of the new products so that this could be done.

Synder Tells Psychology Of Ensemble Selling

In his address on the ensemble method of selling major household appliances, Mr. Snyder said that not the least important aspect of this selling method is that, "the more we focus the buyer's attention on a $1,000 investment, the less important becomes a $10 spread on a washer."

Points raised by Mr. Snyder in favor of ensemble selling included:

It impresses in the minds of the salesman the fact that the sale of one appliance has only started him on the road to continuous sales to the same customer.

It paints a more comprehensive picture in the minds of customers, educating and stimulating them to obtain more rapidly and definitely the final goal of complete electrical service.

It insures more definitely, for every dealer, the possibility of maintaining future sales to the same customer.

Stevens Gives Viewpoint Of Stores on Profits

Discussing: "Can a Major Appliance Department Be Operated at a Profit?" Mr. Stevens offered the following suggestions as to how a department store might build a sizeable appliance business and make money on its operation:

"First," he declared, "it must be a planned and controlled operation with a plan and control that covers all phases of the business. There must be a selling organization trained to supervise and to sell, not just to take orders. There must be an aggressive, well-planned sales promotion program that gives full consideration to each of the various types of appeal that are necessary if real volume is to be secured. There must be a complete, sincere spirit of cooperation between sales, service, credit and collection, and advertising organizations."

To illustrate his point, Mr. Stevens presented two hypothetical operating statements from the major appliance departments of two entirely different types of department stores doing approximately the same total volume of business in cities of approximately the same size.

"Store A," he explained, "majors in high-priced, high-quality merchandise and does a large percentage of its volume on soft lines and ready-to-wear. Store B majors in more popular priced lines and does a reasonably large home furnishings business.

"Let us assume that both stores do a major appliance business of $100,000 and have maintained a gross margin of 35%.

"Store A has its appliance department placed on the fourth floor in a low traffic location and employs five salesmen who spend most of their time outside. The sales expense is 11.5%. Because of the store's great acceptance, reputation, charge accounts, etc., this volume has been developed at an advertising expense of 2.5%.

"Store B has the department located on the third floor next to the credit department, a more advantageous position in regard to traffic. It also maintains main floor displays and a highly promotional program. Three salesmen are employed, but spend most of their time inside. The selling cost is 9.5% and the advertising expense is 4.5%.

"Assuming that both stores have other direct expenses of 4% for buying, clerical work, etc., they would have direct expenses of 19%, which would leave 16% to cover indirect expenses and profit.

"Now the question is, 'Is this operating at a profit?'

"If Store A's indirect expenses (rent, administration, etc.) for its appliance department were 17% on a pro rata basis then this department would literally show a loss of 1%.

"If Store B's indirect expense was 14%, its appliance department would have made a net profit of 2%, but there are other factors to be considered before we can determine whether or not these departments really made a profit or a loss.

"In the case of Store A, most of the volume was developed by outside contact and follow-up, and probably equal volume could not easily be obtained in the same space within the store in some other line of merchandise. This might have made what shows up as a 1% loss look profitable to the management of that store.

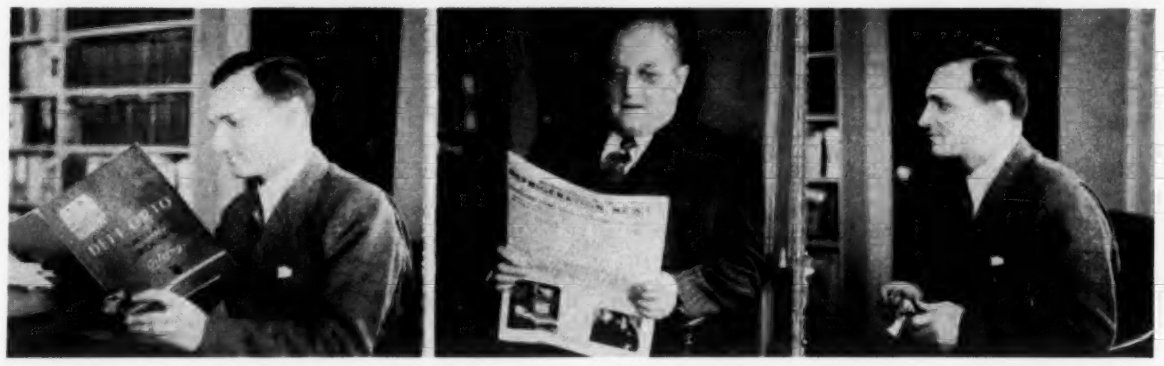
"N.R.D.G.A. goal figures which represent actual operations indicate that even where high indirect expense exists, satisfactory net profit is possible. It may be that some departments showing a net loss are in reality profitable to the store.

"Most department stores have competitors who employ advertising and salesmanship to obtain appliance sales. This competition will no doubt, in many cases, employ so-called unfair or unethical trade practices in trade-ins, allowances, discounts, etc. However, generally, the toughest competitor over the long pull is one who makes a profit and cannot be dissipating all its initial markup.

"It was recommended at the last meeting of the N.R.D.G.A. appliance committee that some concentrated action be taken to correct unprofitable trade practices. I am sure much can be accomplished through the leading manufacturers and their distributors in this respect. Even perfect control of all trade practices, however, will not permit operation at a profit unless sufficient initial markup is obtained, intelligent control of inventory and expenses is effected, and good judgment is exercised in the handling of such factors as trade-ins and off-price promotions.

"No conditions exist which will permit making a profit in major appliances without a management which has a real desire to do an appliance volume and without the exercise of a lot of common sense, and the development of a staff of hard-working, sincere people in the department.

Emissaries from Europe Visit the News



(1) Luciano dell'Orto, air-conditioning engineer for the Milan, Italy, firm of Giuseppe dell'Orto, presents a catalog of the products manufactured by his company to the editor. (2) C. S. Juell, who sells Detrola and Kellogg units in Norway, Sweden, Denmark, Finland, Russia, Czechoslovakia, and Poland. (3) Mr. dell'Orto, a candid camera enthusiast, is noted for his installations in Ethiopia, and on Italian streamlined trains.

Dr. Abbott to Address Detroit A.S.R.E.

DETROIT — Dr. Ernest Abbott, one-time member of the University of Michigan's research staff and now head of his own organization, Physicists Research Co., Ann Arbor, Mich., will discuss one of his new developments, by means of which it is possible to make commercial measurements to the one-millionth part of an inch, when he addresses the local section of American Society of Refrigerating Engineers at a dinner-meeting to be held Feb. 15, at the home of AIR CONDITIONING & REFRIGERATION NEWS.

Dr. Abbott will demonstrate his new instrument and will explain some of the discoveries which its use already has brought about. He also will discuss industrial applications of minute measurements of this nature. His talk will be illustrated by slides as well as by demonstrations.

John Wyllie, general manager, Temprite Products Corp., will act as chairman of the meeting.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

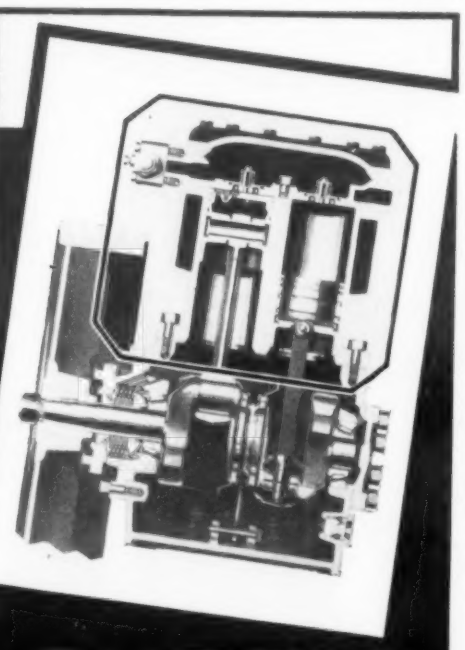
No. 10 of a Series of Curtis Advanced Engineering Features.

CURTIS Removable Cylinders Allow One-Piece Crankshaft, Correct Displacement and Low Motor Speeds

Cylinders on Curtis compressors are easily removable and are interchangeable. This provides easy access to crankshaft and rods, and eliminates the possibility of oil leakage through the usual bottom plate otherwise required. As cylinders of varying sizes can be interchanged, correct displacement is assured for each motor size, permitting lower operating speeds with resulting longer life, freedom from vibration and greater mechanical efficiency. This unique Curtis feature also reduces the number of parts in Curtis dealers' stock.

Engineering refinements such as this are responsible for the outstanding care-free, economical and efficient performance of Curtis units in use today throughout the world. There's a Curtis model for every air conditioning and refrigeration requirement from 1/6 to 30 H. P.

Write to Curtis for complete details of the Curtis line.



CURTIS

"Builders of Condensing Units Since 1922"

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.
1912 KIENLEN AVENUE ST. LOUIS, MO.

Represented in Canada by
Canadian Curtis Refrigeration Co., Ltd.
20 George St., Hamilton, Ont., Can.

The Distributor Who Sells the

Copeland REFRIGERATION LINE

IS BUILDING GOOD-WILL FOR YEARS TO COME!

It is just good business foresight to sell your customers a quality-built Copeland product. Whether you sell a Copeland Household Refrigerator, Commercial Refrigeration, Washer or Ironer, you are wisely building up a backlog of long-time customer satisfaction that will pay you dividends in continued patronage for many years.

Write for Sales Plan
COPELAND REFRIGERATION CORPORATION
Sidney, Ohio

THE FEAST'S ON "COME AND GET IT!"

NO MAN IN THIS INDUSTRY CAN AFFORD TO MISS KNOWING ABOUT KELVINATOR'S PLANS AND PRODUCT DEVELOPMENTS FOR 1938!

IT'S BEEN IN THE AIR for months . . . in lunch-table conversations of half the industry since last fall . . . everybody talking "rumors from Kelvinator".

All right, Gentlemen. Read the story itself!

PRODUCT: the greatest Kelvinator ever produced, and that goes without reservation. It's the most powerful cold-making, ice-making refrigerator ever put in anyone's kitchen . . . yet it will show the way, for bedrock economy, to anything else on the market today.

ADVERTISING: an absolutely new *kind* of advertising for this industry . . . full page, full-color ads in the most powerful publications it's possible to buy.

EACH DEALER'S OWN PROGRAM: a hand-tailored, made to measure, completely rounded, LOCAL ADVERTISING CAMPAIGN for Kelvinator dealers . . . a new, revolutionary, long-awaited IDEA!

COMPLETE SALES-CLOSING HELP: This is the most thoroughly practical, usable, workable program ever offered a dealer in this industry . . . proved in advance . . . *to get that business for you!*

• • •

All of it's right . . . and all of it's ready.

Get all details, climb aboard, and let's get going. Get in touch with your Kelvinator distributor . . . or tell us, and we'll get him in touch with you, quick! KELVINATOR, Division of Nash-Kelvinator Corporation, Detroit, Michigan.

$8,000 CONTEST WINNERS NEXT MONTH

The judges are doing their stuff, as this goes to press. Winners in Kelvinator's big contest for the Electric Appliance Industry will be announced in this publication next month.

THESE SENSATIONAL NEW KELVINATORS ARE REALLY LOADED WITH SALABILITY!

● Full of sparkling new features . . . things to talk about in the customers' own language, because the new Kelvinator is their very own dream of everything a refrigerator ought to be!

Just wait and see how amazed they'll be when you tell them exactly how many big ice cubes Kelvinator will give them for a penny's worth of electricity! (It's 72, at the national average rate for electric current — maybe MORE in your community!)

And that's just an example of the economy and efficiency of Kelvinator's new silent, sealed Polar Power Unit.

Any *man* will be pleased with Kelvinator's new exclusive Speedy Cube ice release that makes it so quick and easy to get ice cubes.

Any *woman* will be delighted with Kelvinator's new, exclusive shelf arrangement that's so completely adjustable, there'll always be room for the 25-pound turkey, or the biggest melon of the season.

And so on down the line . . . through feature after feature . . . scores of them! No other refrigerator made has so much eye-appeal, or sales-appeal. KELVINATOR's easy to sell. Look at it — you'll agree! Arrange to do that now!

1938 Kelvinator *The Champion Ice-Maker!*

Specialty Selling Methods

California Dealer Hunts Up Prospects with Bathrooms--He Sells Them Electric Kit

(Concluded from Page 1, Column 2)

In making the original sale, Mr. Ansel sells the customer on the idea of choosing the appliance store which offers a **complete** electrical service.

Whenever a service call comes in from one of the 1,100 refrigerator customers, the service man who goes out is commissioned to make a survey of the home, determining what other appliances are neded, what the customer's modernization plans are.

Meanwhile, Mr. Ansel keeps in touch with the customer by semi-yearly personal calls in which he leaves a new cook book or some other door opener. On these calls, and whenever he sees the customer in the store, he constantly talks kitchen modernization.

In a great many cases, the customer "comes back" with a statement that she has just spent a lot of money on her bathroom, or that she is planning to remodel it. That's the kind of person he likes to contact.

"Did you ever stop to think how many more hours a day you spend in your kitchen than in the bathroom?" he inquires. "You don't think anything of spending $500 or $1,000 for bathroom modernization—yet you neglect the most important room in your home, the kitchen."

After two or three conversations along this line, the customer begins to take a real interest in kitchen modernization. If she has an electric refrigerator or a range, Mr. Ansel takes the electric dishwasher, showing how flexible its installation can be made. If possible, he has his own staff man make a survey of the kitchen and get an estimate on cost of installing cabinets and dishwasher.

That installation made, the customer almost invariably becomes "kitchen modernization minded," and gradually buys appliances that she lacks. The dishwasher and cabinets "clinch" the complete kitchen sale.

If the customer's credit permits, Mr. Ansel starts working on this second sale before the refrigerator contract is paid out. He has paper carried at a local bank, so that the customer will make payments within a few doors of his store, being reminded of his place every time she pays an instalment. Then, if longer terms are justified, he buys back the old contract and adds on the dishwasher and cabinet job.

"We need more educational effort on electric kitchens, more nation-wide cooperative effort," says Mr. Ansel. "Extensive national advertising by the fixture people and real selling effort by the plumbers have made many people consider bathrooms the most important rooms in their homes, when actually they can't compare in importance with the kitchens. Individually, we've gone after this fallacy, and the effort is bringing results."

Mr. Ansel backs up his personal follow-up work with old refrigerator customers by consistent store promotional effort on the all-electric kitchen. In the center of his shop is a complete General Electric Kitchen, in which the dishwasher—under glass— is kept running constantly.

Every time a new customer comes in, regardless of what she is interested in, Mr. Ansel takes pains to show her that kitchen—with particular emphasis on the dishwasher. Then, twice a year, he holds a cooking school right in the store, extending invitations to all old customers by postcard and to the general public in large-space newspaper advertising.

Many a complete kitchen prospect is obtained from those events. Experience shows that the schools held in the store are far more effective than those held in halls outside.

In the schools, and in taking other visitors through the store, Mr. Ansel tries to see that every individual actually operates the dishwasher. Once she gets the feel of the equipment, a strong desire for ownership is developed, he has found.

This desire is further stimulated by the method of presenting the prospectus on the kitchen survey made in a customer's home. Instead of merely submitting figures and showing the customer a floor plan, Mr. Ansel has a complete drawing made—usually in color—showing a finished kitchen.

When the selling point is reached, the company's control of the whole job makes the closing easier than would otherwise be possible. There is only one contract to sign. Ansel's actually does the entire job, with the exception of installing plumbing and making the cabinets.

Once the kitchen proper is completed, Mr. Ansel goes after another sale on an ironer, or a late model radio. On these two articles, he finds home demonstrations essential—not on others.

Cash Prizes Offered By Stewart-Warner For Ideas from Field

CHICAGO—Stewart-Warner Corp. has instituted a "Sales Builder" contest for all refrigerator dealers and salesmen in the United States and Canada, in which cash prizes amounting to $625 are offered.

Prizes will be awarded to the writers of the best letters on the subject, "What can Stewart-Warner do further to help in the improvement of your business?"

Four $100 awards will be presented for the best letters from the four Stewart-Warner sales regions, and for the best of these four letters an additional $100 will be awarded.

Second best letter from each region will win $25, with an extra $25 going to the best of these four.

Any refrigerator dealer or salesman, whether handling Stewart-Warner products or not, is eligible to compete in the contest, which closes Feb. 28.

Dealer Finds Profit in Continually Expanding His Store & Lines

FORT WAYNE, Ind.—Three major expansion programs in 10 years founded on a policy of good service have enabled J. E. Samsen to become one of the leading appliance dealers in this city.

As reported in AIR CONDITIONING & REFRIGERATION NEWS Nov. 24, Mr. Samsen has moved into his third store, the Good Housekeeping Shop.

Ultra-modern in design, the shop is one of the most beautiful in the country, featuring a complete electric kitchen, complete displays of refrigerators, ranges, washers, radios, and smaller appliances, and alternating blue and brown mural designs on the walls.

Originally, Mr. Samsen operated a sales and service shop for radios. As the first step in the first expansion program, he took on home appliances, continuing his policy of good service by establishing an appliance service department.

Second expansion program involved the transfer of business to a larger, more attractive store, and the adoption of complete lines of appliances.

The new Good Housekeeping Shop represents the third expansion program undertaken by Mr. Samsen. Its service department, housed in the basement of the store, is operated by a staff of trained service men and engineers.

Westinghouse Plans Extension of Program On 'Kitchen-Proving'

COLUMBUS, Ohio—Approximately 40 dealers and salesmen attended a sales demonstration here recently in the conference room of American Sales Co., Westinghouse distributor for central Ohio, and heard of plans to extend Westinghouse's "Kitchen-proving" program.

The meeting was one of a series of four staged by the distributor for the managers and salesmen of the 139 dealerships in its organization.

A factory representative from Mansfield conducted the session, and demonstrated the Westinghouse "kitchen-proving" plan by making a tray of ice cream in one of the 1938 Westinghouse refrigerators which were displayed in the room.

It was announced that Westinghouse planned to have about 1,000 unofficial proving kitchens throughout the country in 1938 to aid in its promotion campaign.

Each proving kitchen is to be in the home of a Westinghouse user cooperating with her dealer. As an official Westinghouse hostess, the cooperating housewife will join the dealer in staging demonstrations in her own kitchen and using her refrigerator.

After outlining the kitchen-proving plan, the Westinghouse representative told the dealers and salesmen of the company's sales plans for 1938.

High-Class Selling Tools for Range Salesmen

The Lumiline oven heater, one of the dramatic sales demonstrators which Westinghouse offers salesmen as a tool in showing oven operation of an electric range. Other 'visualizers' are shown grouped around range.

Westinghouse Puts Emphasis on Training And Novel Sales Tools in Range Drive

MANSFIELD—Need for increased emphasis on retail sales training, especially in regard to electric range merchandising, was stressed by officials of Westinghouse Electric & Mfg. Co. at a recent two-day sales and promotional meeting held here for supervisors and sales promotion managers of the company's range and water heater department.

Fred Hout of the range and water heater department presented the new sales educational program which Westinghouse has devised to satisfy this need, and explained the various tools which the company had prepared to assist in the development of retail sales educational plans in the field.

The Westinghouse plan, Mr. Hout explained, was not based on pure theory, but rather on practical data gathered from the experiences of successful range dealers and salesmen all over the country. It was statements from these field men which convinced Westinghouse that it is the well-trained salesman, the salesman who "knows his stuff," who gets the orders, and resulted in the company's determination to educate its salesmen to the best of its ability.

Demonstration tools, sales literature, and other promotional aids, Mr. Hout declared, all were developed along lines suggested by the men who will use these helps—the successful range salesmen.

Heading Westinghouse's demonstration tools is the Lumiline oven heater, designed to aid salesmen in demonstrating the operation of the two oven heaters. This Lumiline unit can readily be assembled in standard ranges for demonstration purposes.

Other sales aids include: Corox "economizer" light demonstrator, showing the solid top construction of the Westinghouse Corox unit and indicating the unit's four possible heat ranges; the Visibaker door, a heat-resisting glass panel in the oven door which permits observation of the food while it is baking; a special set of floor charts (also usable as displays) which show cross sections of the Corox units and the range's oven, two outstanding features of the Westinghouse 1938 range line.

Speakers at the meeting included Reese Mills, manager of the range and water heater department, and R. M. Beatty, range sales manager.

Salesmen! Read These Resolutions —They're a Shot in the Arm

Acme Electric
Transformers
General Offices: Cuba, N. Y.
Our Resolution for 1938

LET'S BE SALESMEN who have the fortitude to cling to the belief that there is business to get; who expect to dig deep and hard and continuously; who have the tenacity to see every endeavor through to the finish.

SALESMEN who have the patience to explain carefully the merits of our goods; who get as much pleasure working for a small order as for a large one; who will not be turned aside by despair or misfortune.

SALESMEN who won't punt on the second down; who refuse to conceive that people are not buying goods; that people have ceased eating; that people have lost their desires for good clothing, good automobiles, good furniture, refrigerators, radios; who will sell electrical advertising as the means of getting buyer and seller together.

SALESMEN who enjoy getting knocked out of the ring so as to develop the faculty of getting back in to land the knockout blow while the adversary is still bowing for the applause; who never heard of anybody taking an order away from us; who respect but do not fear superior foes; who believe that quotas are set up to be topped not reached.

SALESMEN who fear no untrodden paths; who absorb no pessimism; who carry no false tales; who refuse to destroy character to achieve results.

SALESMEN who radiate enthusiasm, who have the inherent desire to serve others; who are ingrained with loyalty; who recognize the customer as the real boss who pays the bills and the salaries.

SALESMEN who will establish a high objective for 1938 AND WHO WILL ROW THE OARLOCKS OFF GETTING THERE.

THE ACME ELECTRIC & MFG. CO.

NEW '38 REACH-INS

"32" And "46"

- PACKAGE-TYPE
- FLO-E-FEX COOLING
- BEAUTY WITH STURDY CONSTRUCTION
- DULUX EXTERIOR
- PORCELAIN INTERIOR

MODEL 32
NET 32 CU. FT

MODEL 46
NET 46 CU. FT.

Write or wire for prices on these two new MIDWEST PROFIT-MAKERS in the FASTEST GROWING LINE OF HIGH QUALITY REFRIGERATOR CABINETS IN AMERICA! These two new models are ideal sizes for grocery, delicatessen, restaurant, bakery, dairy and many other installations. Latest forced-air cooling with controlled humidity and proper air movement.

MIDWEST MFG. COMPANY-Galesburg, Illinois
SUCCESSOR TO MIDWEST STAMPING & ENAMELING CO.

New *Kitchen-proved* MEAT-KEEPER

Swings Buyers to Westinghouse!

The new Westinghouse Kitchen-proved MEAT-KEEPER marches on to new triumphs. "Most important improvement in years," say practical homemakers in Official Westinghouse Proving Kitchens.

Standard equipment in ALL models of 5 cubic feet or larger, the MEAT-KEEPER gives Westinghouse dealers a big "edge" on competition, paves the way to more sales...easier...more profitably. Get full details of big advertising program and special selling activity. See your Westinghouse Distributor, or write Westinghouse Electric & Manufacturing Company, Department 8130, Mansfield, Ohio.

Ride with the MEAT-KEEPER to bigger sales and profits in *1938!*

EVERY HOUSE NEEDS **Westinghouse** *Kitchen-proved* REFRIGERATORS

Major Appliances

181 G-E Ranges Sold to N. Y. Apartments

LONG ISLAND CITY, N. Y.—An order for 181 General Electric "Comet" ranges recently was secured by Charles Witherspoon, manager of apartment house sales for Rex Cole, Inc., G-E distributor here, with the assistance of Peter Acer.

Of the 181 ranges, 69 were sold to the Kenmore Building Corp. for installation in its apartment house on Corchester Road, 60 were placed in the Foster Ave. apartment building of the Almat Realty Corp., and the remaining ranges were installed in the latter company's building on St. Paul's Place.

Electric 'Kitchen Timer' Now Available

BRIDGEPORT, Conn. — A new electric "kitchen timer," which may also be used in doctors' or dentists' offices, hospitals, photo studios, and similar places, has been announced by the General Electric appliance and merchandise department here.

To set the timer, the alarm knob is turned until a red pointer indicates the desired interval. Any operation up to three and one-half hours may be timed. The timer is available in either black or ivory plastics case.

Kansas City Range Sales Showed Big Jump In Past Year

KANSAS CITY—Sales of electric ranges in this territory during 1937 showed an increase of 55% over those for 1936, according to a report by the Electrical Dealers' Association of Kansas City. This compares with a gain of 30% in 1936 over 1935 sales.

W. T. Foley, of Foley Electric Co., was re-elected president of the association for 1938, and Gordon Buck, of Household Utilities, was re-elected vice president. A. R. Llewellyn, new business manager for the public utilities board, was re-elected secretary; and Harold Strasser, of Strasser Hardware Co., was named treasurer.

1,706,336 Vacuum Cleaner Sales in '37 Set Record

CLEVELAND—Sales of vacuum cleaners in 1937 totaled 1,706,336 units, an all-time high surpassing by 12.9% the 1936 volume of 1,510,953, according to C. G. Frantz, secretary of the Vacuum Cleaner Manufacturers' Association.

Push-Button Auto Set Added by Crosley; Sells Below $25

CINCINNATI—A push-button-tuning automobile radio priced to sell under $25 is Crosley Radio Corp.'s newest addition to its car radio line.

The so-called "safety-tuning" provided by the push buttons is accomplished by a mechanical system which does not depend on motor drive or trimmer condensers for its accuracy. This new system is said to reduce drift, and to make automatic tuning an instantaneous process.

The five tuning buttons can be set in less than a minute by the customer without removing any parts. Only tool needed is a screw driver. The set can be tuned either by means of the push buttons or by the knob on the dial without having to throw any controls.

The new radio is a development of the Crosley Roamio Fiver introduced last year, and, like the Roamio Fiver, it is a one-piece five-tube set designated to be mounted behind and below the instrument board of any car. There are no remote control cables to connect and no spark-plug suppressors are needed.

Other features of the new set include: full-wave vibrator transformer; five octal base tubes in standard circuit; antenna system designed to compensate for any antenna; edge-lighted, slide rule type enclosed dial; full automatic volume control; and simplicity of installation.

Carefully Planned '20-Step' Drive Sells $150,000 in Dishwashers, Disposalls

LONG ISLAND CITY, N. Y.—In its first 80 days of operation, a special promotion campaign on electric sinks resulted in the sale of $150,000 worth of dishwashers, Disposalls, and accessories for Rex Cole, Inc., General Electric distributor in the Gotham area.

The campaign, which is now a permanent program in the activities of the Cole organization, is simple in operation and is planned on 20 steps in sequence.

To formulate the drive, Mr. Cole called a meeting of department heads and outlined the job he wanted done. An electric sink department was created, and Lawrence R. Hills was put in charge.

Jack E. Bryan, of General Electric Co.'s dishwasher and Disposall section, was assigned by Section Manager George D. Kobick to assist in the project.

Third step in the formation of the campaign was the drawing up of definite written policies, prices, promotion, sales plan, and service routine for an entire year.

Compilation of a sales manual came next. The resultant book contained samples of current literature on the dishwasher, Disposall, and unit kitchen, together with promotional material on Whitehead cabinets, copies of salesmen's bulletins on sinks and kitchens, Electrical Standard of Living contest blanks, and the G-E "More Hours for Companionship" booklet.

The manual also included a complete wholesale and retail price list, service policy, and letters explaining the new program. Arrangements were made to publish copies of the manual for the 500 dealers in the Cole distributing organization.

Next there were held sales training schools for distributor department heads, executives, and key men. Three meetings were held: one for the sales story; one for films, records, and sales promotion; a third for the products and actual demonstration.

Regional meetings for dealers then were held, and the sales training school was presented at each. The sales manual was presented to the dealers at these regional meetings.

The training schools then were set up for the dealers' salesmen.

As step number eight, questionnaires were issued to all dishwasher and Disposall users in the territory, inviting frank comments, favorable and unfavorable.

Testimonials were used further to promote sales. Complaints were turned over to Cole's service department for immediate attention.

The ninth step, now in progress, is a continuous direct-mail campaign lasting for 12 weeks.

Additional steps in the general campaign include various forms of advertising, sales hints and helps, and instruction to dealers. Regular Monday-morning sales conferences are held for discussion of the progress of the drive.

A 5% commission was established as a reward for service men who turn in prospects' names which result in sales.

Further promotion of the electric sink was made at the Rex Cole exposition.

Department leaders cooperating in the campaign include Miss Sue Thornton, Bert Strouse, Chet Humes, Fred Beck, R. J. McKenty, William Bishop, and Charles Witherspoon.

A large proportion of the sales are being made in an area where 75% of the people are said to live above the second floor, according to Mr. Bryan.

As part of the campaign, Cole's delivery trucks carry posters promoting the electric sinks.

'Streamlining' Is Mark Of Hotpoint Washers

CHICAGO — Streamlined styling, all white finishes, more massive wringer posts, and a number of mechanical improvements mark the new Hotpoint washer line for 1938.

Seven new washer models are included in the line. Five are of the wringer type, with and without pump; and two are of the spinner type. Also included in the line are three new ironers.

The new line was designed by prominent modern designers, following a survey among women to determine exactly what was desired.

Tubs are bullet-shaped to present a more pleasing streamlined appearance. They are finished in vitreous porcelain inside and out, and mounted in rubber. The correct water level is marked in each model.

Lovell wringers are used on all wringer-type models. Wringers are equipped with a tension adjustment and emergency release bar.

The improved Hotpoint Thriftivator is continued in the new washer. This is the washing principle which circulates clothes through three separate zones of washing action.

The skirt and legs of the new washer are of heavy gauge pressed steel. The skirt completely hides the mechanism, providing an extremely rigid mounting for both the tub and the mechanism.

Spin baskets on spinner models are extremely smooth finish to prevent snagging of clothes. Mechanism is completely sealed, with only four moving parts and simple external take-up adjustments. The motor is ¼-hp. General Electric, mounted in rubber to insure quiet operation.

Utility Pledges Help in 'Radio Interference' Drive

ROCHESTER, N. H.—The Twin State Gas & Electric Co. has pledged cooperation in a campaign against radio interference which experts believe is caused by electrical equipment in homes and factories.

Washers, food mixers, oil burners, dentists' drills, and motors have been cited as possible sources of radio disturbance, and officials of the Twin State Co. have indicated that they will investigate any potential source of annoyance.

Alabama Dealers Will Make Up Prize Jackpot

BIRMINGHAM, Ala.—Under the added impetus of a $4,000 prize contest for salesmen jointly sponsored by the Alabama Appliance Dealers' Association and the Alabama Power Co., dealers throughout the territories served by the utility's lines expect to sell 5,000 electric ranges and water heaters during 1938.

Prize funds will be accumulated from contributions of distributors and dealers, who have agreed to put a certain amount from every sale into a "jackpot."

Awards will be presented at the end of every three months to the leading salesmen in each of four population classes, which have been determined specifically for the contest so that small-town salesmen will not have to compete with those in larger cities.

Dealers themselves will be awarded a cash bonus of $5 for each range and $8 for each water heater added to the power company's lines.

Washing Machine Makers Elect Group Officers

CHICAGO—W. Neal Gallagher, of Automatic Washer Co., was elected president of the American Washing Machine Manufacturers Association at the organization's annual meeting here last week. He succeeds C. G. Frantz, of Apex Rotarex Corp., Cleveland.

R. D. Hunt, Dexter Co., was elected first vice president of the organization; I. N. Merritt, Meadows Corp., was named second vice president and R. C. Stuart, Barlow-Seeley Corp., was chosen third vice president.

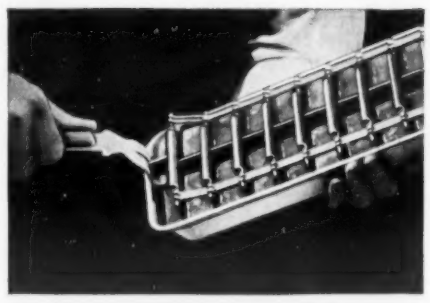
William H. Voss, Voss Bros. Mfg. Co., was re-elected treasurer for his twenty-second term, and Walter K. Voss, of the same company, was elected assistant treasurer.

An active publicity campaign, designed to stimulate consumer interest in washing machines, was voted by association members for 1938.

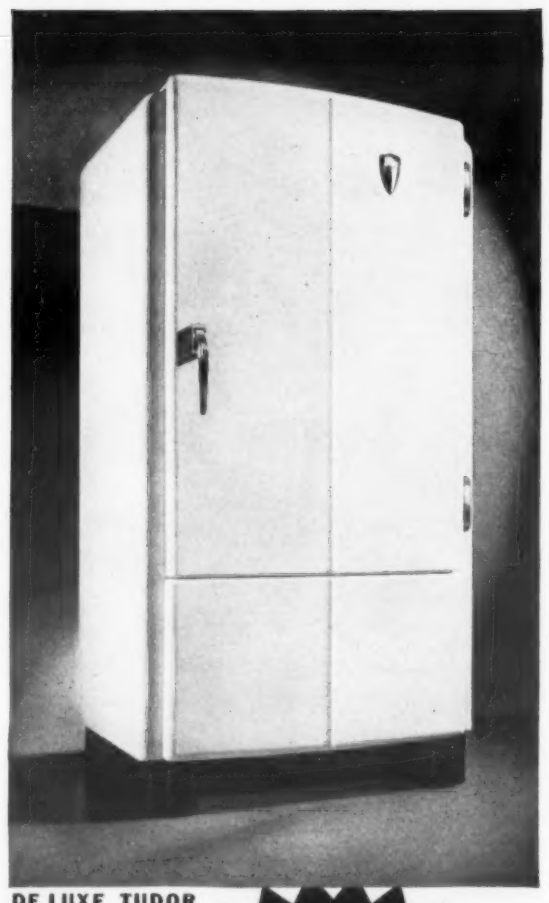
Elected to the organization's executive committee were: J. N. Wicht, General Electric Co.; L. L. Shawber, Westinghouse Electric & Mfg. Co.; L. C. Upton, Nineteen Hundred Corp.; G. M. Umbreit, Maytag Co.; and A. H. Labisky, Barton Corp.

2 CUBES OR A TRAYFUL—INSTANTLY!

New Pop-Ice Trays



Hotpoint's dramatic new sales feature for 1938. Just pop it for instant release of two cubes of ice or a trayful. Eliminates cube waste. Simple—novel—distinctive. Makes a sensational demonstration.



DE LUXE TUDOR

Amazing new Pop-Ice Trays in the new 1938 Hotpoint Refrigerator release ice cubes—two or a trayful—in a jiffy. Iced-tea cubes, delicious fruit juice cubes, sparkling ice cubes for all cold beverages are frozen in record time—released in a flash with the unique Hotpoint Release Lever. No cube waste. No struggle at kitchen faucet.

And this is only one of the sales-closing features you'll find in the new Hotpoint Refrigerator! Circulaire Cooling gives 20% faster freezing at lower cost than ever. Five zones of cold. Adaptable interior. Gliding shelves. And, of course, the famous improved Hotpoint Thriftmaster and Speed Freezer.

Get aboard the Hotpoint Profit Special. See the entire Hotpoint line. Find out why dealers everywhere acclaim Hotpoint the "buy" of 1938!

SPEED-FREEZER
Stainless steel. 16 speeds. Semi-automatic defrosting. New automatic motor protective cutout.

CIRCULAIRE COOLING
20% FASTER FREEZING AT EVEN LOWER COST

Hotpoint ELECTRIC REFRIGERATORS

EDISON GENERAL ELECTRIC APPLIANCE CO., Inc.
5632 West Taylor Street, Chicago, Illinois

ELECTRIC RANGES • WATER HEATERS • SINKS AND DISHWASHERS • WASHERS AND IRONERS

Queens and Brooklyn Dealer Groups Take Action to End 'Cut-Rate' Sales By New York 'Discount Houses'

NEW YORK CITY — Concerted action by distributors to eliminate overnight the cut-rate selling of refrigerators practiced by discount houses in the New York area was asked for in a letter sent to the distributors last week by Electrical Appliance Merchants' Association of Queens, Inc.

W. H. Palmer, secretary of the association, also sent a letter to association members urging them to keep distributor representatives reminded of the subject.

Following is a copy of the letter addressed by the association to the distributors:

"The attached outline of the refrigeration problems confronting our industry at this time is enclosed as promised at our recent meeting.

"Your particular attention is directed to the last item on the list, selling of refrigerators to cut-price houses, better known as the Leech or Parasite of this business.

"It is our belief that here is found the root or foundation of the cancerous growth that is infesting our business, and which we believe can and should be eliminated, to the profit of both the distributor and the dealer.

"In it we have organizations sucking the very life blood of our business, and the legitimate dealer, after developing a sale, loses it by the cut-price route.

WHY PROFIT IS NEEDED

"Unless the dealer can get a fair profit from the sale of his merchandise he can no longer continue to

"1. Pay salesmen commissions;
"2. Advertise in newspapers;
"3. Advertise in Red Books and various other publications;
"4. Buy and distribute literature;
"5. Maintain investments in floor displays;
"6. Display and maintain advertising signs;
"7. Pay telephone, light, and office overhead;
"8. Pay high rents.

—and many other things to promote sales which only he can do.

"When the dealer can no longer continue in business, the distributor will face a difficult problem indeed, for the Leech will have nothing to do with his merchandise then. A concerted action of all the distributors at one time will eliminate this evil overnight. From this beginning has sprung up most of the evils that infest this business, a business which offers such great potential possibilities.

"We earnestly solicit your support. We sincerely offer you our cooperation.

"Very truly yours,
"W. H. PALMER,
"Secretary."

LETTER SENT OUT

Mr. Palmer's letter to dealers of the association follows:

"Fellow Dealer:

"If you attended our last association meeting, you heard the refrigeration program presented to a notable array of distributors. A copy of this program is enclosed. Your earnest support of this program is needed, with especial emphasis on the last item (the cut-price houses).

"You can do a lot to assist your committee with your refrigerator distributor now. Tell him you want action. Tell your distributor's salesman the same thing every time you see him. Keep on pestering your distributor and his salesman every day until you get results. See that your fellow-dealer does the same thing. A concerted action by all of us will accomplish wonders. Remember, General Grant said, 'I will keep on hammering all summer until I succeed.' He did. He got results.

"You can make a profit this summer in refrigeration if you want to. Use that phone now and keep on using it.

W. H. PALMER,
"Secretary."

PROGRAM SUBMITTED

The program to which Mr. Palmer referred in both letters was submitted by Samuel Stein, first vice president of the association and appliance buyer for B. Gertz, Inc., Jamaica, at the Jan. 25 meeting of the association.

It was prepared by the refrigeration committee, and in presenting it, Mr. Stein said that the solution of its 12 points would bring "uniformity out of chaos and profit instead of loss."

The program follows:

1. Clarify interpretation of guarantee provisions.
2. Label and identify each model with price and essential specifications.
3. Set trade-in allowance by uniform trade-in schedule.
4. Control of production by manufacturers.
5. Clearing house for trade information.
6. Policing of dealers by dealer organizations.
7. Fair trade practice law enforcement.
8. Refuse to recognize cooperative buying groups.
9. Refuse to recognize discount courtesy cards.
10. Discontinuing of retail selling under camouflage of apartment house division.
11. Discontinue industrial and retail selling by jobbers.
12. Refuse to supply cut-price houses with merchandise.

Distributor Must Decide Whom He Will Sell to, Brooklyn Dealers Hear

BROOKLYN—Solidly backing the action taken by the Electrical Appliance Merchants' Association of Queens, Inc., the Electrical Appliance Dealers Association of Brooklyn, Inc. has joined the fight against the "growing menace" of discount houses in the metropolitan New York area.

Brooklyn dealers voted to take this action at their last monthly dinner-meeting. Percy Peters, director of the Brooklyn association, revealed that the Queens group had offered to pay its share on any action the Brooklyn organization might take to enforce provisions of the state's Feld-Crawford fair trade act.

Guest speakers at the meeting were Paul Jappe, vice president of the Queens association, and Art Kissner of the sales staff of Warren Norge Corp., metropolitan New York Norge distributor.

Ralph G. Ceriello, chairman of the Feld-Crawford committee of the Brooklyn group, read a speech made to the Queens association on the previous evening by Samuel Stein, appliance buyer at the Gertz department store, Jamaica, L. I., in which Mr. Stein declared that "too much business is lost to second-story discount groups," and called upon retailers to put pressure on the distributors in an attempt to eliminate this evil. Proposed formation of an interest relations committee, whereby various dealer organizations in the metropolitan area might exchange information and opinions and coordinate their efforts to clean up local appliance merchandising methods, was reported.

Mr. Jappe's talk dealt solely with the price situation, main thorn in the side of local retailers. Discount houses, he declared, are getting 40 to 50% of the potential appliance business in this territory, even the rest of the business being affected.

He emphasized the fact that the legitimate dealer does all the work of building up sales, only to lose them to the discount house, which has none of the dealer's overhead problems, and which offers the customer 30 to 40% off on the merchandise.

Distributors, Mr. Jappe told the Brooklyn dealers, must choose between selling to dealers or discount houses. Price maintenance is possible, he declared, but the solution of the problem is really up to the wholesaler. Dealers must continue to put pressure on the distributor until some action results, he said.

NORGE
HOME APPLIANCES
ROLLATOR REFRIGERATION . . . Protected by 10-Year Warranty on the 3-moving-parts Rollator Compressor.
CONCENTRATOR GAS AND ELECTRIC RANGES . . . Advanced styling plus many special convenience features.
AUTOBUILT WASHERS and DUOTROL IRONERS ...America's first fully styled home laundry line.
A SURE SIGN OF SUCCESS IN THE APPLIANCE BUSINESS
A SIGN OF BETTER PRODUCTS . . . Norge leads again with a new line of home appliances that are the greatest in Norge history. Products backed by new tested methods of visual selling—stronger advertising and sales promotion—more dramatic store and window display.
A SIGN OF YEAR 'ROUND PROFIT... There is always sales activity in the Norge line of Rollator Refrigerators, Concentrator Gas and Electric Ranges, Autobuilt Washers, Duotrol Ironers, and package heating and commercial refrigeration equipment. High product turnover and liberal finance plans keep a Norge Master Merchant's capital working all the time. Get the facts about the valuable Norge franchise today.
NORGE DIVISION Borg-Warner Corporation, Detroit, Michigan
MAIL TODAY! Free to Appliance Dealers
A 64-page volume on appliance selling and promotion. Describes a complete plan of store operation. No matter what products you sell, this book will show you how to make more money in the appliance business.
NORGE DIVISION Borg-Warner Corporation,
658 East Woodbridge Street, Detroit, Michigan
I would like to receive a copy of your new book for appliance dealers.
NAME
ADDRESS
CITY STATE

Air Conditioning

Lost Employe Time Reduced by Installation Of Air Conditioning, Proctor & Gamble Finds

CINCINNATI — Air-conditioning equipment helped to cut the average loss of employe's services due to colds and other respiratory illnesses from 2.2 days to 1.6 days during the past year in the offices of Proctor & Gamble Co. in the Gwynne building here.

The soap company's offices occupy five floors of the 13-story building, which is completely air conditioned by a Carrier installation.

Original installation was a test system conditioning only two floors, including the executive offices and lunch and recreation rooms.

The system then was extended to condition all five floors occupied by Proctor & Gamble, later being enlarged to function for the entire office building.

Provisions now have been made to air condition the stores on the ground floor.

Two Carrier centrifugal refrigeration machines supply 330 tons of cooling effect in summer through four spray-type air-conditioning systems. In summer, air is cooled in this spray-type humidifier. In winter, the air is humidified in it before being passed through reheaters for tempering.

Outside air is drawn into the system through automatically controlled dampers. It is mixed with a quantity of return air from the building, the mixture being cleaned by replaceable filters of the throw-away type.

One of the main features of the $200,000 installation is the ejector system which controls circulation and differential in temperature between the inside and outside. This ejector system mixes three parts of room air with one part of outside air coming in at the outlet. Air is changed throughout the building every 10 minutes, and a pilot thermostat controls the temperature according to outside conditions.

Dewey Elected President Of Oil Burner Institute

NEW YORK CITY—Frank H. Dewey, general manager, air-conditioning division, Gar Wood Industries, Inc., has been named president of the Oil Burner Institute.

Milnor Will Handle Carrier in Cincinati

CINCINNATI—Milnor Air-Conditioning Co. has been formed here by L. T. Milnor and Arthur Radtke to serve as representative for Carrier Corp. in a territory including Greater Cincinnati and 20 counties in Ohio, Kentucky, and Indiana.

Temporary offices will be in the Carew tower. Location of display offices, as well as service and installation departments, will be selected shortly, according to an announcement by the company.

Mr. Milnor, president and treasurer of the firm, came to Cincinnati in 1909 as sales manager of Western Electric's branch office. In 1917 he organized Milnor Electric Co. to distribute electrical supplies. With the advent of the radio, he assumed local distribution for about 10 manufacturers.

Mr. Radtke, vice president and secretary of the Milnor organization, has been associated with Mr. Milnor for 18 years. He joined Milnor Electric Co. as a salesman in 1920, and became sales manager in 1924. When Mr. Milnor was named head of the Cincinnati Electric Club in 1932, Mr. Radtke became his assistant.

Elwood A. Haas, commercial manager of Barger, Inc., for the past four years, will be commercial manager of Milnor Air-Conditioning Co. Garry Schultz, who has engineerd many Carrier installations in this territory, will be chief engineer, and Robert Howard will be service and installation manager.

'We'll Air Condition the World!'

Herbert L. Laube, who manages Carrier's export division, tells a visitor that American air-conditioning equipment is boring into markets everywhere on the face of the globe.

'Grilleless' Hotel Bar Installation Utilizes Decorations for Air Supply & Return

DETROIT — An air-conditioning system virtually without grilles keeps patrons comfortable through the hot months of summer in the Motor Bar, cocktail lounge of the Book-Cadillac hotel, Detroit.

A 20-ton Delco-Frigidaire air-conditioning system has been installed in a manner that blends with the decorative motif used in the Motor Bar, reports C. H. Lewis, general sales manager of the R. L. Spitzley Co., which made the installation.

Built in the shape of a great automobile wheel, with the service bar forming the hubs, the Motor Bar's interior decorations interpret the automotive industry. Air is introduced through a small slot at the bottom of the cornice which extends all the way around the room.

Return air is taken from a plaque directly over the center of the bar. As all smoke and stale air is forced to the ceiling at this point by incoming fresh air around the edges of the rooms, the result is a draftless, but adequate, air distributing system.

Direct expansion cooling coils in the conditioning unit are powered by a 20-hp. Frigidaire Freon-12 compressor, which serves the Motor Bar, independent of other air-conditioning equipment in the building.

Another special job undertaken by the Spitzley organization under the direction of Mr. Lewis was the installation of 75 tons of Delco-Frigidaire conditioning equipment in the Commonwealth Commercial State Bank.

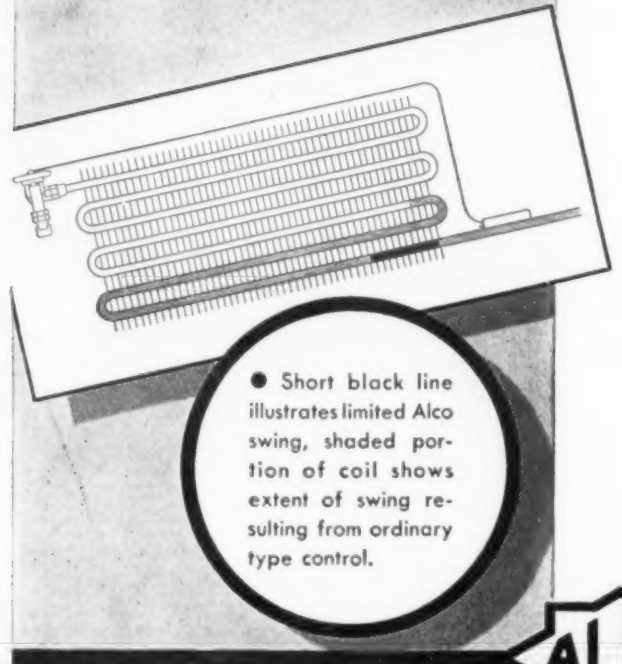
This system incorporates three 20-hp. and one 15-hp. Freon compressors, serving direct expansion coils. Only one fan, located in the central conditioning unit, is employed.

Asbestos aerocel insulation with a plaster finish is utilized in the duct system as a means of reducing noise, as well as to protect the air stream against loss in temperature.

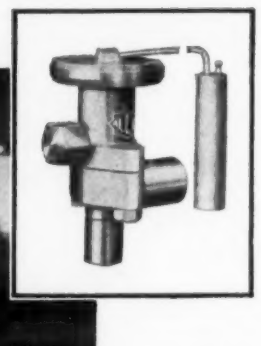
Installed primarily as a measure to reduce complaints from customers during hot weather, the comfort and efficiency of employes has been greatly increased by the system, according to Mr. Lewis.

ALCO VALVES ELIMINATE WASTEFUL, COSTLY WIDE SWINGS

A wide swing—poor control and a wasted opportunity to score.



● Short black line illustrates limited Alco swing, shaded portion of coil shows extent of swing resulting from ordinary type control.



—by providing "STRAIGHT LINE" REFRIGERANT CONTROL

● Alco Thermo Valves, by eliminating wide, wasteful swings in the line of complete evaporation, will produce the greatest efficiency in your evaporator. Alco Thermo Valve control increases the over-all suction pressure, increases compressor capacity, reduces running time and prevents the return of liquid refrigerant to the compressor.

You need the kind of control that only Alco can supply. Ordinary control allows wide variations in the line of complete evaporation — it permits swinging or surging, with liquid returning to the compressor one instant and in only a part of the coil the next. The diagram illustrates the extent of these costly, inefficient swings and shows the "straight line" control of Alco. Alco Thermo Valve control keeps the line of complete evaporation within the narrowest of limits at all times utilizing a maximum of coil surface with a resulting increase in capacity.

Widely known throughout the industry, Alco Thermo Valves are carefully engineered, precision manufactured and thoroughly tested under all possible operating conditions. The experience of Alco engineers is second to none in the entire field of refrigerant control.

Write for bulletin and information on the Alco Thermo Valve and Alco "straight line" control.

ALCO VALVE COMPANY, Inc.
2620 BIG BEND BLVD. ST. LOUIS, MO.

ENGINEERED REFRIGERANT CONTROLS — ALCO — FOR HIGHEST EVAPORATOR EFFICIENCY

G-E Air-Conditioning Institute Inaugurates Training Course; Personnel Placing Planned

BLOOMFIELD, N. J.—First sales engineering school sponsored by the General Electric Air Conditioning Institute was held in the institute's new building here from Jan. 24 to 28, and a second session was scheduled to be held from Jan. 31 to Feb. 4, according to D. W. McLenegan, institute manager.

These first schools are being held for the benefit of engineers and sales engineers associated with G-E air-conditioning distributors. A similar school for beginners in the air-conditioning field is tentatively planned for later in the year.

"Purpose of these first schools is to round out the experience and knowledge of our distributors' sales engineers, so that they can handle more effectively the increasingly complex problems which they are encountering," Mr. McLenegan explained.

In describing the course, Mr. McLenegan declared that "a carefully planned series of sales and engineering subjects were discussed from a practical standpoint, based on problems actually encountered in the field. Factory inspections, surveys of outstanding air-conditioning installations in the vicinity, and attendance at the heating and ventilating show also were included on the program."

The general training program for the institute, as outlined by Mr. McLenegan, includes factory schools for advanced instruction to distributors' men, factory schools for outside men who need training before entering the field, regional schools for general instruction to distributors, up-to-date correspondence courses for the systematic training of new men locally, and a personnel service for the placement of individuals trained in the institute.

Nymberg Heads Detroit Gar Wood Branch

DETROIT—Jerome H. Nymberg has been named manager of the Detroit air-conditioning branch of Gar Wood Industries, Inc. to succeed Norman Saylor, who is no longer with the company.

Mr. Nymberg has been with Gar Wood for 15 years, and prior to his promotion was installation and service manager of the Detroit branch.

Henry W. Jackson has been appointed to the position vacated by Mr. Nymberg.

Appliance Dealer's Store Gets Air Conditioning

BALTIMORE — Air Conditioning, Inc., local Carrier distributor, has installed conditioning equipment in the Howard & Saratoga Sts. store of Pollacks, Inc., furniture, appliance, and radio firm, local unit in the Reliable Stores chain.

Emerson Ventilating Fan Has New-Style Mounting

ST. LOUIS—To help solve the ventilation problem in small retail stores, shops, restaurant kitchens, taverns, and similar places, Emerson Electric Mfg. Co., has brought out a 16-inch ventilator fan, equipped with a new-style mounting ring to make installation easier.

The ventilator operates at 1,550 r.p.m., and exhausts 1,600 c.f.m. of air. Compared with the fan of similar size produced by Emerson in 1937, the new ventilator is said to effect a reduction of 25.7% in watts input per 1,000 cu. ft. of air delivered.

The four blades, of Parker design, are made of steel specially treated for corrosion resistance. New capacitor motor is fully enclosed, and is dust proof. Sponge rubber bushings built into the mounting support assure quiet operation. The bronze bearings are grooved to distribute oil evenly.

Price of the fan, ready for installation, is $28.

Reproducing Climatic Conditions To Test Cotton Fibres Involves New Type of Conditioning

WASHINGTON, D. C.—King cotton, one of the largest and most extensive "money crops" in the country, is one of the latest to yield to the science of air conditioning. The old system of pulling cotton fibres through the fingers to test it for strength, length of staple and spinning characteristics has been replaced with modern testing machinery.

An air-conditioning installation now in progress for the laboratories of the Cotton Marketing Division of the Bureau of Agricultural Economics, Washington, D. C. will not only provide a new standard of control for testing cotton, but will also provide the air-conditioning industry with interesting data.

MEASURE FIBRE STRENGTH

Because of the extreme sensitivity of cotton fibre to atmospheric conditions it has been difficult to establish a standard of tensile strength, even with the aid of precision methods. To get absolute control of measurement of the physical properties of cotton requires accurate control of moisture in the air.

The effect of water content upon the physical properties of cotton has never been determined. Cotton fibres drenched and brought down to a standard of relative humidity will not give the same values as fibres dried and brought up to the same standard.

WHAT IT MAY DO

Scientists of the cotton laboratories hope to solve this problem with precision control of air factors. It may mean, in the commercial field, a difference of many dollars in the value of a bale of cotton.

Cotton fibres are subjected in the laboratories to several minute measurements including diameters as small as $\frac{1}{3000}$ of an inch. The length and strength of these fine strands are dependent upon relative humidity. To arrive at fixed standards of control of humidity which does not vary more than 1% is necessary.

In order to arrive at a basis of comparison, cotton from the arid deserts of Arizona and the humid fields of Louisiana must be studied under common conditions of temperature and humidity to arrive at a basis of comparison. It is also necessary, from time to time, to have conditions in these two varied climates duplicated.

MAY NEED UMBRELLAS

Precision study is conducted in two "extreme rooms" where temperatures range from 32 to 100° F. and where humidity may be controlled at any point between 10% and 97% relative.

All kinds of climatic conditions will be reproduced and, according to Dr. Enoch Karrer, senior cotton technologist, workers may conceivably be called upon to conduct experiments where umbrellas or overcoats will be necessary.

One of the most difficult problems in the testing of cotton is caused by air currents set up by radiation from lights, machines and people. Even the breathing of workers has been a factor which interferes with experiments on the buoyant cotton fibres.

UNIFORMITY NECESSARY

To offset this condition baffles have been erected on the laboratory tables to protect the cotton from workers. This has been unsatisfactory as it interferes with the air conditioning at the point where work must be done.

Uniformity of control is essential over long periods of time because of the fact that fibres lie on tables for hours during the measuring and designating of lengths. Samples are arranged side by side on a velvet pad in a graduated series of lengths. Precision results in each sample depend on constant control of atmospheric factors in the room.

DONE BY NEW YORK FIRM

To meet the unique requirements set forth by the Cotton Marketing Division an air-conditioning system using well water, chemicals, and mechanical refrigeration was selected. The contract was awarded to the Research Air Conditioning Corp. of New York, and the installation will cost approximately $45,000. Three laboratories for cotton classification are included in the project. R. B. Crawford of Washington will be the supervising engineer and Dr. Karrer will collaborate as consultant.

Conditioning the cotton "extreme rooms" will not follow the conventional air-conditioning methods. Walls, ceilings, and floors will be surfaced with a series of $\frac{5}{8}$-inch flat copper tubes which will carry the water and chemical salt solution that serves as refrigerant.

Control and relative humidity will be obtained with the chemical absorbent "Calorider" rather than using the dewpoint method.

COPPER TUBES EXPOSED

The copper tubes will be exposed on walls and ceilings and laid on "Celotex" insulation 4 inches thick. Tubing will be applied in a layer of "Enamelite" (gilsonite) which, when it hardens has the appearance of black wax.

Walls will be moisture and air proofed. Tubing running through the floor will be embedded in a material composed of magnesium cement and asbestos. It will be covered with a half-inch layer of "Permastone," another magnesium product having extreme strength and durability.

Windows having a western exposure will be filled with Owens-Illinois glass bricks, between the double glazing now in use.

COOLING MEANS

Cooling water is obtained from a well having a flow of 340 gallons per minute at 60° F. Only a 100-gallon flow will be necessary, which will be reduced to the proper temperature by five tons of mechanical refrigeration. The total load is 45 tons. Relative humidity will be controlled independently of the temperature through the use of Leeds and Northrup instruments giving direct readings on humidity.

A large part of the heating load occurring within the room will be removed by radiation to the tubes exposed on walls and ceilings. It is expected that air currents will be reduced to as low as 3 feet per minute and will not exceed 6 feet per minute. As the normal velocity for comfort is 20 feet per minute it is possible that fans may be necessary near the heads of laboratory workers for breathing comfort.

RADIATION USED

"Ordinarily, heat loads are taken care of by convection," Dr. Karrer points out. "That is, air must be forced into the room and over walls, lamps, tables, motors, and other heat-generating sources in order to cool them. This implies a great deal of air motion, in many instances actual drafts.

"In the proposed installation the heat load will be absorbed by radiation to the surfaces of the cooling coils, and by convection over them.

"Only fresh air necessary for health will be introduced into the air-conditioned spaces. This is a small quantity compared with the amount necessary to carry the heat load away by convection over cooling coils."

SKYLIGHT SPRAY

Classification rooms are located on the sixth floor of the building, and an unusual area of skylighting intensifies the sun load. Water from the well will be sprayed over the roof and skylights at all times to reduce the temperature to 65 degrees. Experiments will eventually be conducted in warming the roof and lights with warm spray water in winter.

It is expected that the cotton laboratories will become, in fact, air-conditioning laboratories. Results of experiments in the refined control of temperature, relative humidity and air currents will, according to Dr. Karrer, be made available to the industry.

Dr. Karrer feels that the study of air currents may open new fields and new methods of air conditioning, especially in places such as hospitals where accurate control is essential.

EVERY
AIR CONDITIONING MAN
SHOULD KNOW

A NUMBER OF FUNDAMENTALS CONCERNING AIR CONDITIONING AND REFRIGERANTS

IF the air conditioning installation is a sizable one involving a duct system, the duct system should conform to the rules published by the National Board of Fire Underwriters in NBFU Pamphlet No. 90 entitled, "Regulations of the National Board of Fire Underwriters for the Installation of Air Conditioning, Warm Air Heating, Air Cooling and Ventilating Systems" (July 15, 1937). These regulations are published by the Board at 85 John Street, New York City, or 222 West Adams Street, Chicago. See Paragraph 191 covering refrigerants and specify condensing equipment for permissible refrigerants.

If the system is a small commercial or air conditioning installation containing not over 100 pounds of refrigerant, design to conform to the "Standard For Air Conditioning and Commercial Refrigerating Equipment" (Subject 207, June 16, 1937) of Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago. See Paragraphs 36 and 37 and draw specification for air conditioning refrigerants in accordance.

Should your client desire a unit system containing not more than 20 pounds of refrigerant, Underwriters' Laboratories, Inc., have a "Standard For Unit Refrigerating Systems" (Subject 207, June 15, 1937). Secure a copy of this standard and consult Paragraphs 29 and 30 for permissible refrigerants for air conditioning.

KINETIC
FREON
REG. U. S. PAT. OFF.
safe refrigerants

*"Freon" is Kinetic's registered trade mark for its fluorine refrigerants.

If you desire to consult Underwriters' Laboratories Report MH-2375 entitled, "The Comparative Life, Fire and Explosion Hazards of the Common Refrigerants," inquire at the reference desk of your Public Library. Or we will mail a copy, postpaid, on receipt of one dollar.

By following these rules, you avoid any possibility of penalty to your client in insurance rates for using refrigerating and air conditioning systems in non-conformance with regulations.

If you would be safe respecting refrigerants, specify the safe "Freon"* refrigerants for air conditioning, which meet all the specifications of the National Board of Fire Underwriters and the Underwriters' Laboratories, Inc.

"Freon" refrigerants are non-toxic, non-flammable and non-injurious to foods, furs, books, paintings and other fragile and perishable articles.

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Distributor-Dealer Doings

Downing Is President Of Essex League

NEWARK—R. F. Downing, general manager of E. B. Latham & Co., distributor in this territory for Leonard refrigerators, Zenith radios, Thor washers, and Bendix home laundries, has been elected president of the Essex Electrical League for 1938.

Other new officers of the association, which is composed of distributors, contractors, manufacturers, and others engaged in various branches of the electrical industry, are: Les Phillips, manager, Westinghouse Electric Supply Co., vice president; Ben Golden, sales manager, Eastern Electrical Supply Co., treasurer; James Stapleton, secretary.

Group chairmen for the year are: Earl C. Pullen, Krich-Radisco, Inc., radio; H. Sachs, maintenance; H. Edgel, manufacturers; E. J. White, contractors; Al Reilly, supply jobbers; Lee Williams, specialty distributors.

Lappin Electric Moving To Larger Quarters

MILWAUKEE — Lappin Electric Co., Grunow distributor in Wisconsin and the northern peninsula of Michigan, has signed a long-term lease for the four-story concrete building at 1022 N. Fifth St. here and will use this building as its new quarters as soon as remodeling and modernization operations have been completed, according to David Lappin, president.

Lack of space and facilities in its previous location necessitated the company's move, Mr. Lappin declared. The new warehouse will have 30,000 sq. ft. of storage space, modern fixtures, and completely equipped appliance showrooms. In addition, the new location will afford ample parking facilities.

Besides Mr. Lappin, present officials of the company, which has been in business since 1919, are: vice president, Sam Rabuchin; secretary, Anna Lappin; sales and advertising manager, Gerald D. Lappin; state sales manager, Charles S. Mittelman.

Wagner Is Chairman of Dayton Show Committee

DAYTON—A. E. Wagner, vice president of the Gas and Electric League of Dayton, has been appointed chairman of a special committee to consider plans for a proposed household appliance show to be held in cooperation with the Construction League of Dayton March 22-26 in the Coliseum at the county fairgrounds here.

Gibson Appoints 12 New Distributors

GREENVILLE, Mich. — Appointment of 12 new distributors for Gibson household electric refrigerators has been announced by F. E. Basler, general sales manager of Gibson Electric Refrigerator Corp.

New distributors are: Harry Moll, Inc., Denver; Listenwalter & Gough, Los Angeles; Northeastern Radio Co., Boston; R. H. McMann, Inc., New York City; D'Elia Electric Co., Inc., Bridgeport, Conn.; Biehl's, Inc., Pottsville, Pa.; Albany Distributing Co., Albany, N. Y.; Coast Radio Supply Co., San Francisco; United Electrical Supply Co., St. Louis; B. O. R. Radio Co., Reading, Pa.; Hunter Bros., Fayetteville, N. C.; and Blackwood's, Inc., Raleigh, N. C.

New Jersey Dealers to Exhibit at Home Show

NEWARK—Members of the Essex Electrical League will display their lines of modern home appliances in 30 booths at the third annual New Jersey National Home Show, to be held in the Sussex Ave. armory here during the week of March 19.

Included among the exhibitors who have made space reservations under the league's auspices are: Public Service Electric & Gas Co., Westinghouse Electric Supply Co., E. B. Latham & Co., Beller Electric Co., Eastern Electric Supply Co., Chicago Flexible Shaft Co., B. & O. Radio Co., Krich-Radisco, Inc., and New Jersey Bell Telephone Co.

The league's show committee is comprised of James H. Stapleton, secretary, and commercial manager of the Public Service Electric & Gas Co., and William J. Morrison, manager of "House Practical" for the utility.

Radio Service Laboratory Is F-M Distributor

PORTLAND, Me.—Radio Service Laboratory, Fairbanks-Morse radio distributor with branches in Manchester, N. H., Barre, Vt., and Bangor, Me., as well as in Portland, has been appointed distributor for F-M refrigerators in Maine only, according to H. A. Brockelman, F-M's New England district manager.

Refrigeration and home laundry equipment will be handled out of the branch here, under the personal direction of Art Levesque, president and general manager of the firm. The company will sponsor a daily radio program on three Maine broadcasting stations to boost all three lines of Fairbanks-Morse products.

Ft. Wayne Dealers Plan Cooperative Showing

FORT WAYNE, Ind.—At a recent meeting of the Fort Wayne Electric Appliance Dealers' Association, the following committees were appointed to organize the public exhibition soon to be sponsored by the group:

Membership—W. H. Thompson, chairman; Joseph Stucky, J. S. Johnson, and H. J. Schroeder. Board of governors—Joseph W. Dye, chairman; Herman Kaiser, C. H. Lines, Charles Watterson, and Mrs. Wegner. Publicity and advertising—Otto Adams, chairman; Earl Wunder, Arno Spiegel, and Al Levy.

Program and entertainment—Mr. Lines, chairman; Charles O. Koons, Mr. Dye, and E. C. Goette. Appliance exhibit—Roy Bridges, chairman; Mr. Adams, co-chairman; Fred Harber, Martin Raake, and H. H. Parrett.

Landers, Frary & Clark Distributors Visit Plant

NEW BRITAIN, Conn.—Among distributor executives who recently visited the Landers, Frary & Clark offices and plant here to preview the 1938 Universal major appliances and discuss merchandising plans were the following:

E. H. Reif, Chas. B. Scott Co., Scranton, Pa.; J. H. Walker, Midland Electric Co., Cleveland; H. J. Funk, Albany Hardware & Iron Co., Albany, N. Y.; F. E. Baldwin, Harold King, and Robert Baldwin, Baldwin-Hall Co., Inc., Syracuse, N. Y.; E. H. C. Angell, Canfield Supply Co., Kingston, N. Y.

Mr. Lewis, Lewis Automotive Equipment Co., Worcester, Mass.; H. O. Brown and Mr. Angers, Angers Supply Co., Springfield, Mass.; Ward May, May Auto Parts, Inc., Pittsfield, Mass.; O. M. Woods, Wayne Hardware Co., Fort Wayne, Ind.; Wheless Gambill, Gambill Distributing Co., Nashville, Tenn.; H. B. Vaughan, Geo. H. Wahn Co., Boston.

C. E. Taylor, Taylor Supply Co., Harrisburg, Pa.; L. H. Weishar, Greer & Laing, Wheeling, W. Va.; C. E. Maloy, H. C. Prutzman Co., Altoona, Pa.; H. Allison, J. C. Irwin, and F. E. Clinton, Glasgow-Allison Co., Charlotte, N. C.; Thomas Bayless, Commonwealth Sales Corp., Richmond, Va.

Peiper Supervises Reader's Shipping & Service Depts.

HOUSTON, Tex.—J. H. Peiper has been appointed general supervisor in charge of all departments in shipping, receiving, and service work for Reader's Wholesale Distributors, Crosley distributor in this territory.

Mr. Peiper heads a staff of 10 men in the various departments.

He formerly held a similar position with E. J. Herman Sales Co. of San Antonio, one of the first Crosley distributors in Texas

Frigidaire's Show Hits Wide Open Spaces

The two dashing caballeros are Frank Pierce, left, Frigidaire household division manager, and Joe Straus, president, Straus-Frank Co., Frigidaire distributor at San Antonio. The occasion was the arrival in San Antonio of the Frigidaire convention crew. The little Spanish-Indian on the right is Viejito Flojito. He is reputed to be more than 100 years old and to have been an infant in San Antonio when the Battle of the Alamo was fought. He also is reputed to have shouted to the Frigidaire convention crew, "andale," meaning "It's time to get going," the convention slogan.

Wesco Takes Building In Terre Haute, Ind.

TERRE HAUTE, Ind.—A five-year lease on the Ramsey building here has been taken by Westinghouse Electric Supply Co., which will use the building as a new distribution warehouse to serve the Wabash valley territory, comprised of central western Indiana and eastern Illinois.

The building, which has a floor area of approximately 15,000 sq. ft., is now being remodeled, but will be ready for occupancy March 1.

Temporary supervisor of this new branch, which will employ about 50 people, will be R. L. Brown, sales manager for Westinghouse in Indianapolis. A manager for the branch will be named later.

Texas Electrolux Dealers Given 1938 Plans

HOUSTON, Tex.—More than 100 Servel dealers, advertising men, salesmen, and factory representatives met here Jan. 24 and 25 for a district sales and advertising conference. The new Servel Electrolux refrigerator was on display during the meeting.

H. M. Wickman, Servel district sales manager, and Millard Cook, district sales promotion manager, were in charge of the meeting. A. L. Seligman, of Straus-Frank Co., Servel distributor in this territory, acted as chairman.

Southern Electric Now Handles Hotpoint

LITTLE ROCK, Ark.—Southern Electric Co. has been appointed dealer for the full line of Hotpoint electrical appliances here. Leonard C. Ellerbogen is general manager of the firm, and Robert O. Harris is sales manager. Initial campaign for the dealership's 10 salesmen will feature electric ranges.

Passano Opens Store In Sunny Florida

MIAMI, Fla.—Leonard W. Passano, formerly connected with the Baltimore branch of Westinghouse Electric Supply Co., now is operating a Westinghouse refrigerator and appliance shop here.

New Baltimore Dealer

BALTIMORE — Samuel Lessing has opened a dealership here, handling Westinghouse refrigerators and major appliances, oil burners, and heaters.

Form Norge Dealership

GREENWOOD, Miss.—C. B. Carroll and L. A. Thomas have formed the Delta Appliance Co. to deal in Norge refrigerators and appliances in the Greenwood area.

G-E Takes Distributors' Show Across Country

DETROIT—Forging another link in a long chain of coast-to-coast distributor meetings which began Jan. 7 in Atlanta, a crew of General Electric Co. factory representatives under the supervision of W. T. Christy, manager of G-E's range and water heater division, staged a two-day product presentation and sales meeting at the Detroit Leland hotel Feb. 2 and 3 for the benefit of G-E Supply Corp., local distributor.

First day of the meeting was given over to presentation of G-E's appliance line for 1938, with special emphasis placed upon ranges and water heaters. About 4,000 pounds of stage equipment, which the factory group carried with it, was used to make the presentation more effective. No professional actors were employed, however, all parts in the presentation being taken by the factory men.

Second day was devoted to informal discussions between factory representatives and members of the local distributing organization.

Floyd Slasor, regional manager in this territory, served as general chairman of the two-day show.

Following the opening meeting in Atlanta, the troupe headed west, stopping at Dallas, Los Angeles, San Francisco, Portland, Ore., Salt Lake City, Kansas City, Mo., St. Louis, Chicago, and St. Paul.

At the end of the session here the group was to go to Cleveland and then start a four-stop swing through the east, with meetings scheduled at Syracuse, N. Y., Boston, New York City, and Philadelphia. The tour will end Feb. 19.

Average attendance at the meetings, according to Mr. Christy, has been approximately 275.

Besides Mr. Christy, factory men who participated in the showing here included: C. W. Theleen, central station department; J. F. McBride, F. W. Cuffe, and J. R. Poteat, range section; Earl Norling, refrigeration sales department; L. H. Miller, domestic refrigeration sales manager; Walter P. Smith, commercial refrigeration department; Charles Enderle, electric sink sales manager; E. Springer, stage manager.

Peny-Wize Stores Are Opened in Dallas

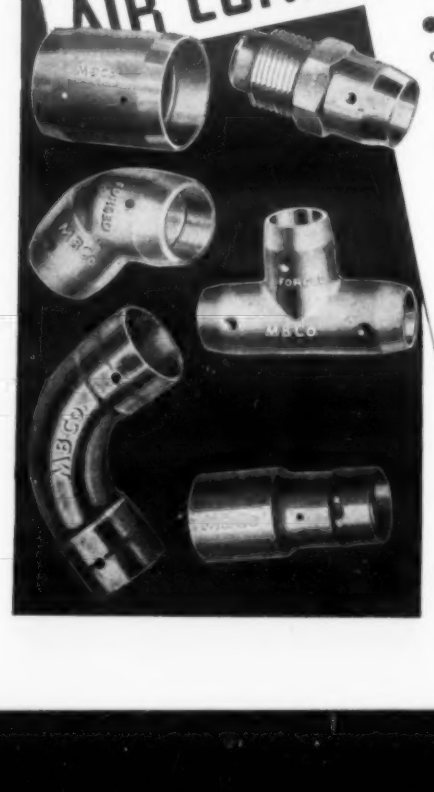
DALLAS—The Peny-Wize Stores, new retail electrical appliance organization, has opened here as dealer for the complete line of Fairbanks-Morse electrical appliances. The new firm also handles automobile supplies and accessories. R. C. Kanaar is organizer and manager of the dealership.

Viking Supply Co. Formed

NEW ORLEANS—Viking Supply Co. has been formed here as distributor for Stewart-Warner appliances, with M. R. Bush as president.

TOP PERFORMANCE FITTINGS •

FOR REFRIGERATION AND AIR CONDITIONING ★



● The use of STREAMLINE Solder Fittings assures permanently tight connections for electric refrigeration and air conditioning work. They are absolutely refrigerant and seep-proof. Vibration cannot work them loose. They form a connection actually stronger than the tubing—yet much lighter and more quickly completed, and they reduce materially your fitting cost.

Brass Forgings which have a tensile strength of approximately 60,000 pounds per square inch, are used in the manufacture of our flared tees, elbows, valve bodies, etc. Specially treated drawn brass rod is used for integral parts of valves, flare couplings, fitting caps, etc.

We manufacture the most complete line of valves, fittings (both flare and solder type) and accessories for mechanical refrigeration work. Send for catalog R-3 and Price List 2003.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

★STREAMLINE
TRADE MARK REG. U.S. PAT. OFFICE
COPPER PIPE AND SOLDER FITTINGS

Appliance Dealers at 'Small Business' Meeting Draft Loan Recommendations

(Concluded from Page 1, Column 5)

should conform with sound business principles.

4. That such instalment financing should be on a basis that will, during the life of the contract, maintain a substantial equity on the part of the customer in the product being financed, thereby protecting the interest of both consumer and dealer.

5. Elimination of the slogan "No Down Payment" in advertising.

6. That the administration abandon all attempts to regulate competition between different business units and instead, pursue a policy of enforcing competition, coupled with a strict and energetic enforcement of the present anti-trust laws.

HELPING SMALL BUSINESS

The business research group made the following recommendations on this subject:

1. The establishment of a permanent national committee of representatives of smaller businesses, to advise and counsel government regarding research specially designed to aid smaller businesses, and to arrange for dissemination among smaller business men of research material available through government.

2. Approbation of service rendered by research agencies, particularly of the Bureau of Foreign and Domestic Commerce, and data already available for general guidance of smaller business men, but stressing the need for making known to small businesses what is available, and also more definite and detailed study of small business problems.

'SMALL LOAN' NEED

Retailers in household appliances, foreseeing that in the event the new federal housing bill reducing down payments to 10% is passed, dealers will need greatly increased inventories to be in a position to handle the business in major appliances resulting, took an important part in drafting "small loan" recommendations to the President. This group, organized to discuss the question of loans to small companies, immediately sidetracked the issue of whether to get them in favor of "how" to get them.

The small loan plan of the conference, as presented to the President, recommends:

1. Establish a procedure for the purpose of encouraging and facilitating loans to smaller businesses, including provisions for loans on inventories and accounts receivable on machinery and equipment and buildings, with provision for the consideration of character as a prime factor in conjunction with the ability to repay.

2. Inaugurate and promote such legislation as may be needed to accomplish such a program through the existing banking system, preserving the freedom of action and judgment of the national and state banks and providing substantial protection with respect to the principal of such loans to national and state banks within reasonable restrictions.

OTHER RECOMMENDATIONS

Such legislation should also provide that loans against fixed assets be subject to retirement within a period related to the reasonable life of the assets acquired; that a rate of interest which will not be burdensome but which will return a reasonable profit to the banks be applied to such loans; that the possibility of rediscounting such loans at a moderate cost above the rediscount rate of the Federal Reserve Bank be provided under reasonable restrictions; that a greater facility for the granting of character loans of a nominal amount be provided.

The committee recommended that an agency entirely separate from the Reconstruction Finance Corp. be set up, with representatives in a substantial number of key cities, the representatives to be successful local business men familiar with the industries and businesses of the area which they serve.

Although the various committees were given specific subjects to consider, nearly all went outside their fields to adopt resolutions asking for repeal of the capital gains tax and the undistributed profits tax, and for modification of the Securities and Exchange Commission law and the Wagner Act.

More than 80 business men engaged in the distribution of electrical and air-conditioning equipment were registered at the conference. These included appliance, furniture, department, and hardware store operators.

C. I. T. Opens New Office In Southeastern Georgia

ALBANY, Ga.—C. I. T. Corp. has opened a new office here to serve southeastern Georgia, with Harold L. Dorsey in charge. Mr. Dorsey has been with C. I. T. for a number of years, and has been branch office manager in Johnson City, Tenn., and in Rome, Ga.

Arrangements for the opening of the new branch were made by R. G. Johnson, district manager.

Norge Dealership Opened By Morris Bass

PHILADELPHIA — Jewel Home Electric Co., owned by Germantown Electric Supply and managed by Morris Bass, has opened here as a retail outlet for Norge refrigerators and washers, Westinghouse appliances, and Bendix home laundry, as well as Philco, RCA Victor, Zenith, and Emerson radios. The company also will handle the Mixmaster and Toastmaster lines.

New Midwest Packaged Commercial Units Have 'Flow-E-Fex' Cooling Unit

GALESBURG, Ill.—Three two-door models and two four-door models comprise the 1938 standard line of Midwest commercial refrigerator cabinets, recently announced by Midwest Mfg. Co.

List prices, f.o.b. Galesburg, of the five cabinets complete with evaporator are: model 138, $204; model 168, $239; model 198, $267.60; model 32, $342; model 46, $427.30.

Respective prices for the cabinets only are: $150, $170, $190, $276, and $354.

The two-door models are the 138, with net capacity of 13.5 cu. ft.; the 168, with net capacity of 16 cu. ft.; and the 198, with net capacity of 19.5 cu. ft.

All three are equipped with Peerless "Humidi-Pack" evaporators, are insulated with from 3 to 3½ inches of balsam wool, have Bonderized-Dulux exterior and porcelain interior finish, and have chrome-plated brass hardware, including touch-type door handles.

Automatic interior light, porcelain drip pan, and round-wire, hot-tinned shelves also are standard equipment.

The new "packaged" four-door models, 32 and 46, incorporate all of the features of the two-door cabinets, but are equipped with the "Flo-E-Fex" forced convection cooling unit. They also have a dry storage compartment in the base, next to the compressor compartment. In model 32, the dry storage compartment is 13 inches high, 21 inches wide, and 19 inches deep. Dimensions of the model 43 dry storage compartment are: height, 13 inches; width, 33 inches; depth, 32 inches.

The new Flo-E-Fex unit cooler, embodying the "Krack" combination pyramid deflector and drain pan together with screen eliminator, operates on the forced air principle of cooling.

A four-blade fan mounted near the top of the unit draws air from near the ceiling, forces it over the finned cooling coil, and discharges it downward over the pyramid deflector to the floor of the cabinet.

Cooled air is further diffused by a fine mesh screen around the discharge opening. Discharged cooled air gradually rises in the cabinet.

Standard Flo-E-Fex units use methyl chloride, sulphur dioxide, or Freon as the refrigerant. Special units are available for ammonia or brine with hot-dipped galvanized steel coils.

Standard coils are of ⅝-inch tinned copper tubing, with aluminum fins rigidly spaced four to the inch. A heat interchanger is installed inside the housing to increase evaporator efficiency and keep the suction line from sweating.

Housing of the Flo-E-Fex is of galvannealed sheet steel finished with two coats of white Dulux.

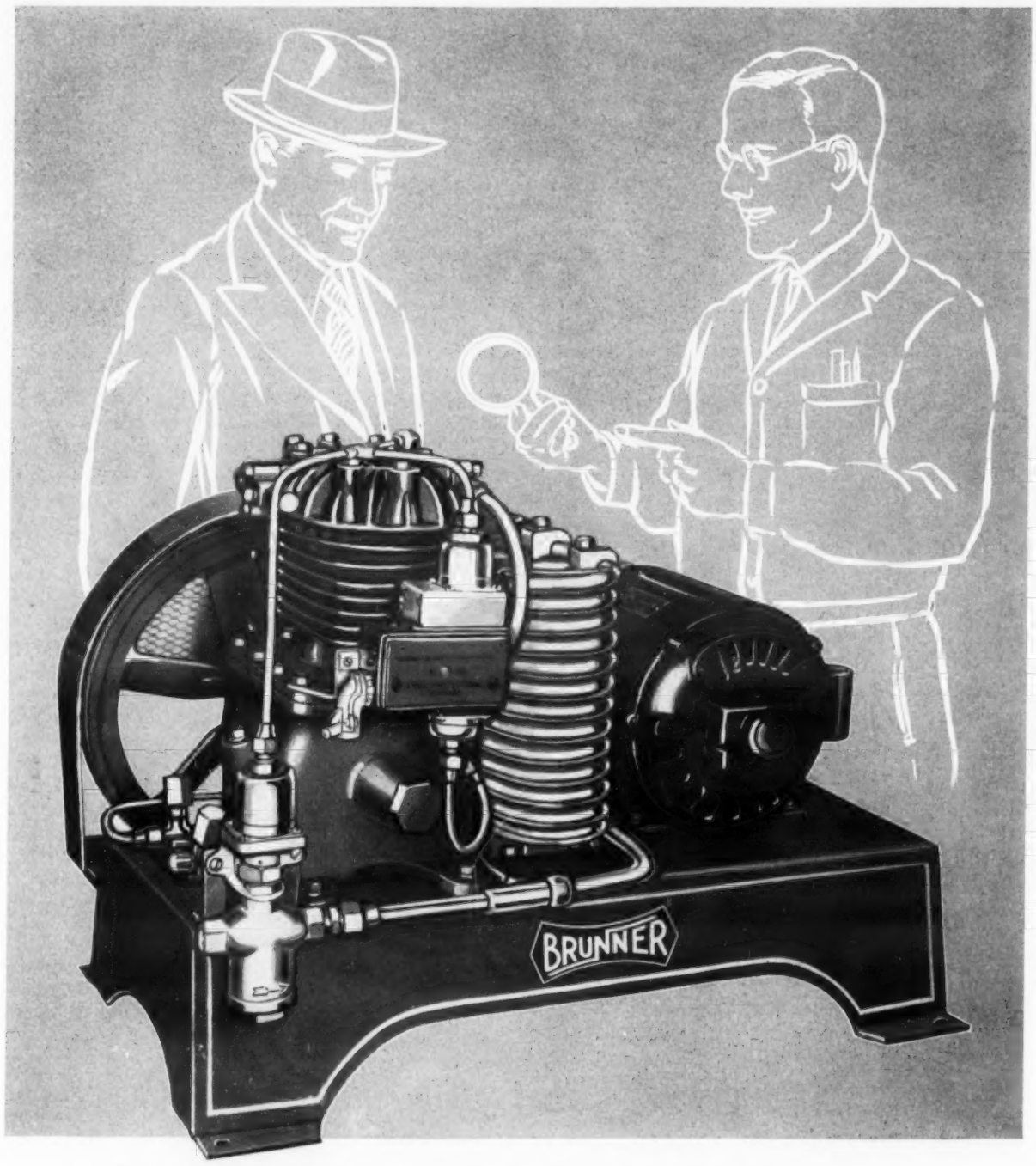
Respective ratings of the Flo-E-Fex units furnished with models 32 and 46 are 90 B.t.u. per hour and 120 B.t.u. per hour.

Specifications of the five standard 1938 Midwest cabinets are as follows:

* * *

Specifications of Midwest Commercial Models

Models	138	168	198	32	46
Overall Dimensions:					
Height (inches)	67.75	69.75	71.5	80	80
Width (inches)	40	44	47	55	68
Depth (inches)	26	26	28	31.5	34.5
Capacities:					
Gross (cubic feet)	14.8	17.5	21.2	34.1	48.7
Net (cubic feet	13.5	16	19.5	32	46
Shelf area (square feet)	22.3	26.3	31.5	43.3	63
Ice cubes (number)	168	224	280	..	..
Ice (pounds per freezing)	11.5	15	18.5	..	..



BRUNNER DESIGNS SURELY PROVE THE VALUE OF

SIMPLICITY

Even in theory, the production of mechanical refrigeration is a complicated process, requiring a complicated mechanism. But complication often paves the way to trouble—especially in the field of practical mechanics. Guided by this belief, Brunner engineers have constantly striven to eliminate detail, combine functioning members, *simplify*. The 1938 Brunner Refrigerating Equipment accents this goal. Solidly constructed for exacting commercial service, Brunner units are marked by an absence of non-essentials. No excess baggage! The result: trouble-free refrigeration, quick-to-repair should the occasion ever arise. Let us bring you full information on the NEW Brunner line—air and water-cooled condensing units for every refrigerating and air conditioning requirement from 100 lbs. to 15 tons of refrigeration. Write: Brunner Manufacturing Co., Utica, N. Y., U. S. A.

IT'S BRUNNER FOR *economical* SERVICE

AIR CONDITIONING & REFRIGERATION NEWS

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'Little Business' Knows What It Wants

EXCITEMENT prevailed in Washington last week when representatives of "little business" were invited down to present their views about the Roosevelt Recession and what should be done about it. Everybody, it seemed, wanted to talk at once; and no wonder. It was about time.

Ever since he took office Franklin D. Roosevelt has been calling in people to talk to him, or to hear him talk. He has heard the college professors, the labor union organizers, the pork barrel politicians, the reformers, the socialists and communists, the professional social workers, the farm organization men, the generals and admirals, and smooth diplomats from foreign powers.

On occasion he has even invited in the representatives of Big Business, the "princes of privilege" and "economic royalists" for their regular drubbing at the whipping post.

Long-Delayed Hearing

But this is the first time he has ever given the small business men—the real bulwark of the nation—a chance to be heard.

What they said must have burned the ears off the New Dealers. For years the latter have been prating that they have been passing laws to curb Big Business in order that Little Business might get a better deal. From N.R.A. and T.V.A. right down to the undistributed surplus tax, practically all such legislation has had the reverse effect.

Year by year the Administration has ground its heel a little further into the neck of Little Business. Year by year the restrictions have increased. Year by year Little Business has had to hire more accountants and lawyers to keep up with the multiplicity of "returns" which must be made to comply with new taxes and new regulations.

Couldn't Pay Attention To Jobs

As a result, the pressing problem of getting business back to normal and of employing more men hasn't been getting the attention it deserves. "Little business" has run itself frantic trying to keep up with new legislation, has become bowlegged and humpbacked from carrying the burden of new taxes, and is worrying itself gray-headed over what the government is likely to do next.

Every time the President or the reputed Crown Prince, Robert H. Jackson, let loose another blast at the 60 Families, 60,000 to 600,000 "little business" men crawled further into their holes. And so, when at long last these latter were given an opportunity to speak, long-pent-up feelings blew out like an overinflated tire on a hot day.

New Deal Laws Hit Dealers

When the N.R.A. was first launched, the NEWS did more than come halfway to meet the idea. A special "Blue Eagle" issue was published; entire cooperation was extended. Anything to take the people's minds off their troubles, it was thought; and since this was what the Brain Trust (at that time we took these Oracles at face value) had devised to meet the situation, why, let's give it a whirl.

Representatives of the NEWS attended code hearings, prepared data for use of the administrators, reported progress of the N.R.A. But it wasn't long before we saw that the Blue Eagle was scratching out the eyes of our customers—dealers and "small" business men. From that moment until the Supreme Court read a death sentence over its bloated body, we fought it.

Came then the T.V.A., and the same story all over again. From that territory subscribers wrote in to say that their appliance business was being shot to hellangone by the operations of the EH&FA and T.V.A. It wasn't the utilities which were crippled; it was small business again.

Big Business Can Protect Itself

And so it has gone, right up to the present. It is the dealer, the small retailer, who is suffering most from the Roosevelt Recession.

This paper has never felt as if it had to go to bat for the big corporations which are to be found in the industry. General Electric and Westinghouse and General Motors can take care of themselves. Nor have we felt that men like E. G. Biechler, George Mason, Howard Blood, or Louis Ruthenburg needed our advice in solving their income tax problems or combating adverse legislation.

But we have expressed ourselves freely and pointedly in opposition to much of the New Deal and its machinations because we could plainly see (and could understand from *our own experience*) what it was doing to Little Business.

The Little Business Conference, before it closed, drew up a noteworthy set of resolutions. There were 23 of them; and except for signs of irritation over tax complications and the National Labor Relations Board, they were most respectfully worded. They can be summed up as follows:

Praiseworthy Resolutions

Repeal the undistributed profits tax and modify the capital gains tax.

Repeal or rigidly amend the Wagner Labor Relations Act.

Simplify tax forms.

Make labor unions assume "equal responsibility" with the employers in carrying out agreements.

End Government interference with business and stop "malicious" attacks on business by Administration spokesmen.

Organize a permanent council of small business men to cooperate with the Government.

Curtail Government expenditures and balance the Federal budget.

Eliminate tax-free securities.

Clarify provisions of the anti-trust laws and increase the penalties for violation of such laws.

Reduce the unemployment tax in stabilized industries.

Give up wage-hour regulatory legislation.

Handpicked Group of Representatives

It should be noted that this conference — which issued so thoroughgoing a repudiation of New Deal policies—was not composed of a bunch of soreheads who staged a species of "hunger march" on Washington. Rather, the delegates were handpicked by Secretary Roper and New Deal congressmen as being "representative" of all types of small business.

Mr. Roosevelt asked for it, and what he heard was plenty. For example, he recently let loose a public blast against instalment selling. Read, then, the sane words issued by the Little Business Conference committee on instalment selling:

Instalment Selling Suggestions

"1. Instalment selling is sound, and is considered responsible for an important part in the recovery movement.

"2. When confidence is restored, instalment selling will be a means of restoring mass purchasing power.

"3. Terms and down payments should conform with sound business principles.

"4. Instalment financing should be on a basis that will, during the life of the contract, maintain a substantial equity on the part of the customer in the product being financed, thereby protecting the interest of both consumer and dealer.

"5. The slogan "no down payment" should be eliminated in advertising.

"6. The Administration should abandon all attempts to regulate competition between different business units and instead pursue a policy of enforcing competition, coupled with a strict and energetic enforcement of the present anti-trust laws."

For five long years it has been the assumption that business wanted the Administration to lead it by the hand. What business really needs, and is praying for, is that the Administration will get off its neck.

LETTERS

Henderson Gratified by Pleasantaire Policy

Air Conditioning Manufacturers' Association
Southern Bldg., Washington, D. C.
Feb. 7, 1938

Editor:

As I believe you know, for more than a year the Air Conditioning Manufacturers' Association has been actively working for a better general understanding of the difference between true air conditioning (summer or winter and year around) and devices sold only for summer room cooling.

It is, therefore, gratifying to note, from the editorial in the Feb. 2 issue of the NEWS, "Air Conditioning Needs Terminology," that Richard F. Roper, president of Pleasantaire Corp., is giving timely and constructive support to ACMA's efforts by stating his opposition to the selling of room-cooling units as "air conditioners."

Confusion in the public understanding of air conditioning can be as harmful to the makers of room coolers as it can be to the manufacturers of air-conditioning equipment.

The man who has purchased a room cooler in the expectation of obtaining the full benefits of true air conditioning may have the conviction that he has been oversold.

Because of the greater compactness and convenience of the summer air-conditioning equipment being offered this year by various companies, there is more likelihood of confusion in the public mind than ever before.

Many of these new designs of equipment effectively provide the functions of true air conditioning as defined by the Federal Trade Commission and the National Better Business Bureau, and yet they are as portable as a household electric refrigerator.

WILLIAM B. HENDERSON,
Executive Vice President.

'Rubbing Salt in The Wound'

Curtis Refrigerating Machine Co.
St. Louis, Mo.
Jan. 31, 1938

Editor:

The tax burden upon business has been so much a subject of discussion the last several years that the public is getting calloused to such protests taking the attitude that "everybody objects to taxes anyway, nevertheless, we have to have them."

But one tax burden that probably has been entirely overlooked even by those who have protested the high taxes as such, is *the cost of making the returns*, entirely aside from the amount of returns themselves.

The writer wonders if you noticed a little paragraph on the editorial page of the Jan. 22 issue of the Saturday Evening Post. It was too bad it was buried instead of being placed in a box on the cover page or in some other prominent position. Believe that if every publication would do something along this line, the facts might sink in after while.

It was something to the effect that in 1927 the Curtis Publishing Co. made 14 different tax returns at a preparation cost of $850 whereas in 1937, 10 years later, they made approximately 44,500 tax returns at a preparation cost of $21,000—all of this contrasted to only one return for which they had to make in Canada in each year.

Along the same lines there was some very good publicity in the issue of Life of the same week in which the picturized story of the tax situation as it affected a typical industrial firm, Peck & Stow, in which it was also brought out that this firm paid $21,000 in Social Security taxes plus $2,600 rent for a machine to figure these taxes out and that while their sales increased 26% last year, their taxes increased 88%.

In other words, this business of making tax returns is getting to be an industry in itself. There have been cases where the cost of filing a return exceeds the return. When a tax payer has to spend thousands of dollars and employ many clerks and experts simply to make it possible for him to pay his taxes, it looks as though this is "rubbing salt in the wound."

Now this is the point of this letter—it is true that the trade publications as a rule do not reach the general public to any considerable degree, but your readers are dependent on industry for their welfare and are voters. If every publisher would take his own case and determine how many returns he made last year and the cost of preparing same and publish that information in a "box" on the front cover of his publication, every issue, don't you think that after a while your readers would become a little more tax conscious? We hope you will give consideration to this suggestion.

L. C. BLAKE,
Advertising Mgr.

Answer: It's a good suggestion and we'll try to get the figures together.

'Around the World'

I have had the pleasure of reading part of your "Around the World with a Candid Camera" in AIR CONDITIONING AND REFRIGERATION NEWS. However, in booklet form I know that I am going to reread it thoroughly, and you may be sure that at least one-half of it is going to be read with especial interest because I happen to be a transplanted Englishman.—J. H. Wilson, Sherer-Gillet Co., Marshall, Mich.

The magnificent booklet on England and Palestine, prepared by Mr. Taubeneck, proved welcome reading over the New Year's weekend. I wish you and your organization a continuation of the splendid success during 1938 as you have enjoyed in the past. —Reuben E. Ottenheimer, Ottenheimer Bros., Inc., 1001-1045 Montford Ave., Baltimore, Md.

The book has many pages of pleasant information, and it has recalled my trip to England, four years ago, very vividly.—Ira H. Reindel, Norge division, Borg-Warner Corp., Detroit.

'Farewell to the Wooden Icebox'

(From the newspaper column by Arthur 'Bugs' Baer)

The world's sale of 2,500,000 electric refrigerators for 1937 shows that civilization is getting closer. And that the aristocratic luxury is speedily democratized into a necessity in 10 easy payments.

The electric refrigerator marks the end of the haphazard glacial period of domicile hygiene. No poet ever sang the glory of the old wooden icebox because there was none. If there had been it would have been immortalized by Field or Riley.

We do not wish to spoil your modern appetite with a post mortem memorial of the old icebox, which has failed to find an eternal niche in the Smithsonian or the Metropolitan museums.

Nevertheless, when some future explorers start cracking our ancient cornerstones like walnuts, we wish them to discover and decipher this yellowed parchment perpetuating the old hulk that stood on the back porch:

The wooden ice box had a cellar door on the top which you raised in order to introduce the solidified refrigerant. This compartment was heavily insulated in order to prevent a lambchop from taking a chill. It was the universal habit to put the butter and milk right on the ice in company with a bit of cream, some tomatoes, a head of lettuce, and various brands of tinfoiled cheeses. The result was that everything tasted like everything else and nothing was itself.

When you opened this compartment you got an avalanche of aromatics that would gag a buzzard, and that only a herring could challenge. Beneath was a drip-pan that handled everything but its own reservoired overflow.

The main compartment of the wooden icebox was dedicated to legs of mutton, large bowls of fat, yesterday's leftovers, and tomorrow's minced astonishments and hashed surprises. There were thousands of undigested odors in the old wooden icebox. And even when they merged they never surrendered their individual characteristics.

The icebox had the moist atmosphere of a damp cellar with none of its privacy. It soon lost its retail freshness and youthful outlook on things. The action of the melting water caused the wood to rot and inquisitive little silver bugs to make their quick, alert appearances and nervous getaways. We never knew the name of these little giant microbes, but they seemed to give the old wooden icebox a busy look. There was always something going on inside.

The top of the box was always scarred and chipped because the ice never fitted. It was necessary to chop the ice down to size. Then we gathered the cracked ice off the floor for the lemonade pitcher. Nothing was ever wasted in the days of the old wooden icebox, and nobody ever looked too closely at the raisins in the rice pudding. If they were raisins all right. And if they weren't raisins why hold a post mortem?

"FACTORY: BUILD MORE KELVINATOR WASHERS — LAST FORECAST TOO LOW!"

That's what the sales department said after dealers had seen the new 1938 Kelvinator line . . . showing even more enthusiasm than expected!

FROM DISTRIBUTORS everywhere the word started coming in: "Dealers mightily pleased over new Kelvinator Washers. Thanks for a grand product!"

Talk about music to a sales department's ears! But pretty soon we began to do a little figuring.

That's why we've gone to the factory with a revised schedule. Revised . . . upward!

See them yourself!

So—thanks to dealer enthusiasm—we're off for a big year on Kelvinator Washers in 1938. And we think you'd like to come along.

Get a look at this amazing new Kelvinator line right now.

See the complete line of seven stunning ALL-WHITE models.

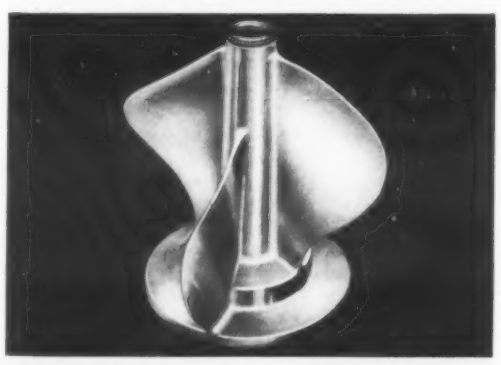
See Kelvinator's exclusive PRESSURE-ATOR Wringer . . . and you'll *know* why it makes an instant hit with any woman.

See Kelvinator's exclusive FIN-FLEX AGITATOR . . . with its faster, gentler washing action, the most scientific known!

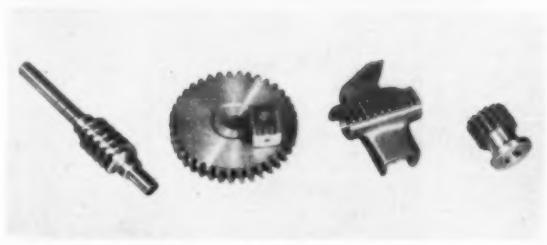
Get the story of the simple, sturdy mechanism . . . only five moving parts in an amazingly compact housing.

There are lots of reasons why *dealers* made us increase our production schedules on the new Kelvinator Washers. You owe it to yourself to find out what they are. Get in touch with your distributor today. Or write:

Kelvinator, Division of Nash-Kelvinator Corporation, Detroit, Mich.



EXCLUSIVE! Kelvinator's Fin-Flex Agitator. Every woman's interested in gentle action that saves clothes, yet washes them thoroughly at the same time. And you can show how this does both . . . like nothing she's ever seen before.



EXCLUSIVE! A simplified and amazingly compact mechanism, with only five moving parts, oil sealed in for life! Quiet, trouble-free, efficient.

EXCLUSIVE! Kelvinator's Pressure-Ator Wringer gives the woman finger-tip control to get the scientifically correct adjustment for every type of fabric. A grand sales clincher, easy to demonstrate, easy for the customer to understand.

Kelvinator MODERN HOME ELECTRICAL APPLIANCES

Engineering

Hoesel Explains Theory Followed in Development of 'Shredded Fin' Coil

By A. H. Hoesel, Chief Engineer, Peerless of America, Inc.

A STUDY of the related heat transfer art, as revealed in domestic and foreign literature and also patents, reveals that the first form of such apparatus consisted of piping formed into netted form.

Since the cost of such apparatus was comparatively high, for a given heat load condition, the economic pressure finally evolved the use of plates attached to the piping in order to increase the effective heat transfer surfaces; thereby reducing the cost of the apparatus for a given heat load condition.

Since economic pressure is an ever present force, there finally were evolved, through trial and error method in general, the various limitations of plate and tube dimensions, which would give the greatest heat transfer value for the least expense.

At this point, it seemed practically impossible to increase the amount of heat transfer for a given sized unit, other things being equal, except by the use of thicker fin plates which would reduce the temperature differential between the pipe and the extreme portion of such fin plate served by that particular pipe.

Since then, Peerless engineers—realizing that the greatest amount of heat transfer in a refrigerant cooling unit took place at the refrigerant wetted internal surfaces of the tubing, which, in horizontal tube circuits, is the bottom portion of the tube—started the use of rifling.

Peerless rifling is a particular method of providing a spiral path adjacent the inner walls of the refrigerant tubing whereby, with the proper proportions of this spiral path, the refrigerant vapor velocity is partially transformed into a rotary motion which carries the refrigerant liquid all around the inner walls.

We claim the average heat absorption of a finned cooling unit is increased by 30% with the use of properly proportioned rifling.

Since the use of rifling increased the internal efficiency of the tube, we were now concerned with increasing the efficiency of the heat transfer from the air to the outer surfaces of the cooling unit.

A finned cooling unit was built and tested for its heat absorption capacity under certain conditions, and the results tabulated.

Then the fins were shredded, by means of a special tool, and the former tests duplicated. The shredded fin coil showed an appreciable increase in heat transfer, under similar conditions, as compared to the coil prior to shredding.

Realizing the importance of this discovery, we were than concerned for several years with developing machinery for producing a shredded fin coil. Numerous designs of machinery were worked out and methods of shredding were experimented with, until the present form of surface and its particular method of manufacture were evolved.

Prior to building a complete automatic machine, it was decided to recheck this particular type of surface for efficiency as compared to the normal fin type.

Therefore, two coils were made identical with each other, except that one coil had solid fins encircling the tube and integral therewith while the other coil, constructed in the same manner and of identical proportions, was slot milled so that each fin was cut into 36 projections. This slot milling involved the removal of 40% of the original fin surface.

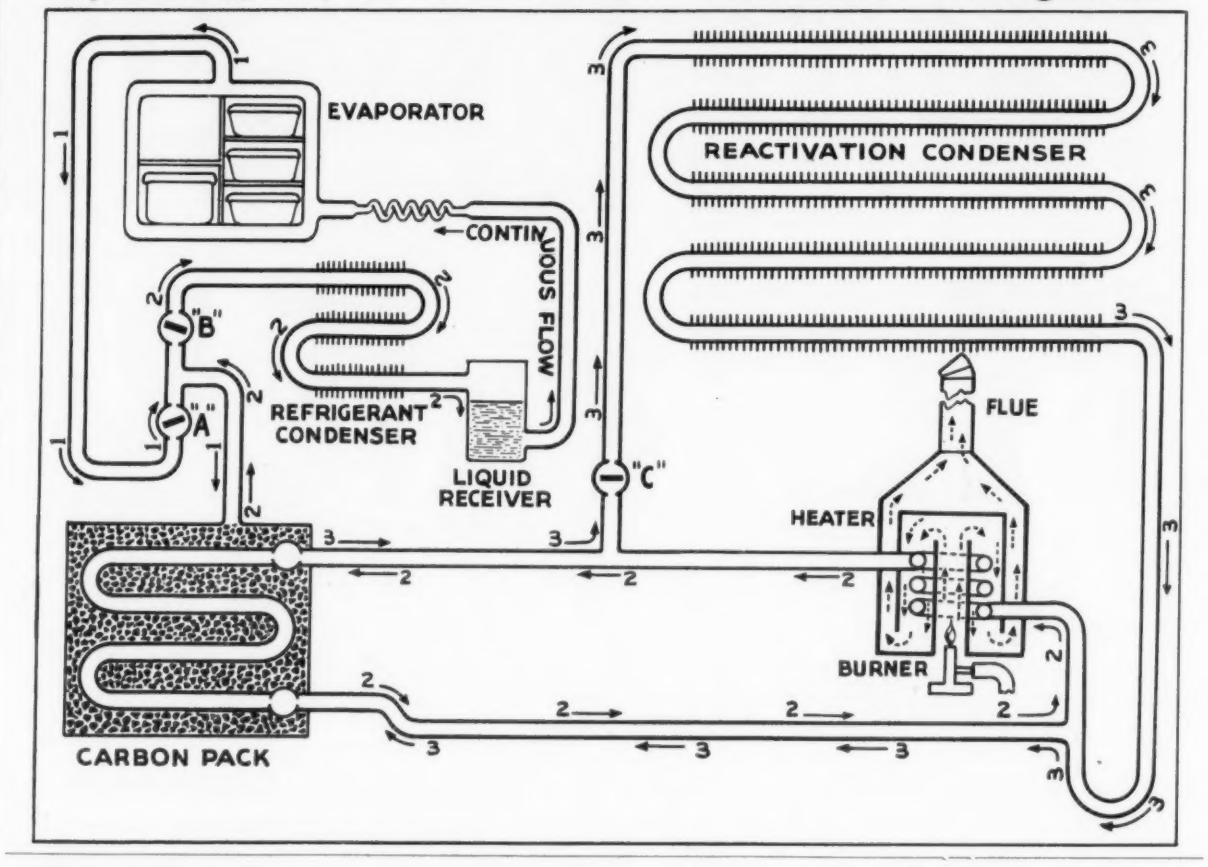
These two coils were now tested out simultaneously under identical conditions of air temperatures, volumes, and velocities; also refrigerant temperatures.

Paradoxically, the slotted fin coil, having 40% less fin surface, showed a 51% increase in heat absorption capacity over the heat absorption capacity of the fin coil having 100% fin surface.

After this test, which conclusively demonstrated that this particular type of coil had a definite economic position in heat transfer probelms, the automatic machinery was then constructed, and proved satisfactory.

While it is impossible to enumerate all of the practical problems encountered during the experimental stages in attempting to raise a sliver-like portion from and perpendicular to a tube wall, the method finally used is simplicity itself and capable of very wide variation as regards the number of spines per square inch of tube surface, the height of the spines and also the cross-sectional area of the spines.

Operating Cycle of Grunow 'Thermene' Refrigerator



Adsorptive Power of Activated Carbon Used in Grunow 'Thermene' System

By the Engineering Department, General Household Utilities Co.

THE 'Thermene" system of refrigeration is the result of careful, planned research into the use of "activated" carbon and the refrigerant known as Carrene.

Carrene has been used in Grunow electrically-powered refrigerators for four years, in conjunction with a rotary suction pump which created approximately 27 inches of vacuum . . . this causing the Carrene refrigerant to boil in the evaporator, and so absorb heat from the food compartment.

In Thermene refrigerators, a container filled with a few pounds of pure, dry charcoal (activated carbon) is connected to the evaporator, producing, by its adsorptive power, 27 to 29 inches of vacuum.

Briefly, there is a short but very powerful refrigerating period, a quick even heating of the carbon pack, and a fast cooling of the carbon. This trio of operations completes a cycle, and the carbon is again ready to pull Carrene.

The cycle of operation is as follows: in the schematic diagram, arrows identified as "No. 1" relate to the first stage, "No. 2" to the second stage, and "No. 3" to the third stage.

1. The Refrigerating Stage

When a Thermene refrigerator is first put into operation, the action of the activated carbon is identical with that of a suction pump; the "refrigerant" Carrene in the evaporator promptly boils and absorbs heat from the food compartment, the Carrene vapor passing down through check valve "A" to the carbon pack where it is held in the pores of the charcoal.

Its course is indicated by the "No. 1" arrows. Since check valve "B" operates in the opposite direction, it is kept tightly closed during this activity.

2. The Heating Stage

It is now necessary to remove the "refrigerant" Carrene from the carbon, and this is done by means of a miniature "steam heating" plant which consists of finned pipes embedded in the carbon and a small low-pressure Carrene boiler called the "heater."

A thermostat now becomes operative at a pre-determined point, and the gas burner is turned "on." This heats and vaporizes a second supply of Carrene which we will call the "reactivating" Carrene, located in a small coil or pipe in the heater, and the resultant "Carrene steam" is carried to, and through, the finned pipes within the carbon pack, liquifies, and returns to the heater (as shown by some of the "No. 2" arrows). During this heating stage, valve "C" is closed.

The "reactivating Carrene" is permitted to bring the temperature to the carbon pack up to about 225 degrees, which operation drives the "refrigerant" Carrene from the pores of the charcoal, up through check valve "B" to the refrigerant condenser, where it returns to its original liquid form (see "No. 2" arrows). Collected in the liquid receiver, this "refrigerant" Carrene is continuously "metered" back into the evaporator.

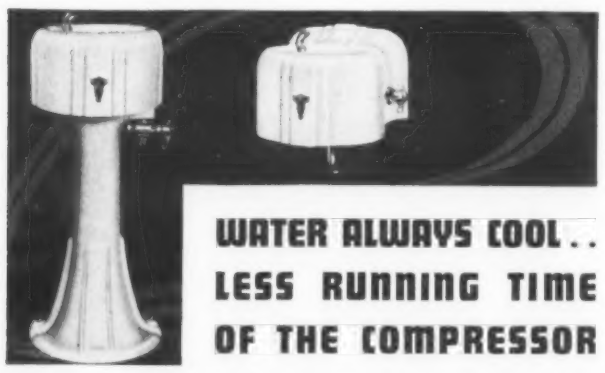
An important part of Thermene operation is the fact that, valve "C" being closed, the heating of the "reactivating" Carrene in the coil of the heater traps a considerable quantity of this Carrene up in the "reactivation condenser" where it remains during the heating of the carbon pack.

3. The Cooling Stage

The "steam heating" of the carbon pack having driven the "refrigerant" Carrene from the charcoal, it is now desirable to cool the pack quickly. Automatic controls turn off the gas flame, open the valve "C," and cool Carrene from the reactivation condenser drops down to the carbon pack (as indicated by the "No. 3" arrows).

Heat is absorbed from the pack as its heat vaporizes the cool "reactivating" Carrene and this vapor now passes up through valve "C," returning to the reactivation condenser where it is liquified.

The Carrene of the heating-cooling system is then back to its original state, valve "C" is closed, the carbon is cool and reactivated, the "refrigerant" Carrene is in the evaporator and liquid receiver, and the system is ready for another cycle of operation.



WATER ALWAYS COOL . . LESS RUNNING TIME OF THE COMPRESSOR

In the Temprite Multiple System water is cooled at the fountain . . . not in the basement.

This plan eliminates the line losses due to piping cold water about the building . . . means less running time of the compressor, consequently there are no line losses to overcome.

The result is more cold water per dollar . . . less expensive to install and maintain . . . and the installation is more satisfactory.

The first ounce of water drawn is cold. No water is wasted in waiting for it to run cold. Each fountain can be set to any desired temperature . . . which it will deliver at all times, regardless of load or weather.

The Temprite is an easy system to install. The simplicity of installation and efficient operation will quickly pay for it.

Write for illustrated folder W-1.

TEMPRITE PRODUCTS CORP. *Detroit, Mich.*

It's *the* REMPE AUTODRAFT UNIT COOLER

~ *that gives Humidity and Air Circulation!*
WITHOUT "RAINFALL!"

Condensation and a "rainfall" drip every time you walk in a refrigerator is a sure sign of something lacking. Rempe Autodraft provides a maximum of humidity, but keeps it circulating in the air where it *should* be. For interesting folders and data—

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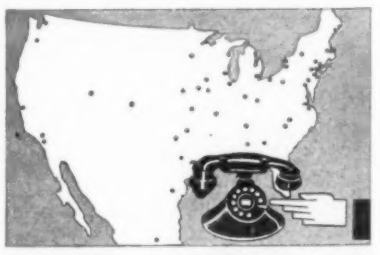

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Commercial Refrigeration

Dealer Finds Profit in Giving Attention To Variation in CO_2 Content of Beers

KALAMAZOO, Mich.—A good sparkling glass of beer with just the right amount of foamy white collar may be a prosaic thing to some people, but to Hugh North, of North-Davis, Inc., Kelvinator dealer here, it represents the proper solution of a neat engineering problem.

"There is more to a good glass of beer than most people think," said Mr. North. "When we install Kelvinator commercial equipment on a beer job we always instruct the owner in the use of the Temprite coil and give him the usual information about keeping coils and all equipment clean.

"But we go further than that. Keg beer varies widely in its carbonization. For this reason we adjust the system to the kind of beer the owner is using and instruct him in how to change the adjustment when he changes brands of beer.

"The western beers, from Milwaukee and St. Louis, have a much higher carbon dioxide content than our local Michigan beers. We use a little gauge on each keg, to see how much air pressure the beer requires to have it draw perfectly. If the owner switches to a beer made in Milwaukee, the pressure must be reduced. If he takes on a local beer, perhaps the pressure must be increased.

"By careful attention to what seems, at the outset, to be a very small and insignificant matter, we find that our beer jobs work better than most customers really expect them to work. Experienced owners know that having the beer draw 'just right' not only saves beer, but is a source of real satisfaction to customers.

"Our method of handling beer jobs is but an example, however, of the care we exercise in all our commercial work. When we put a job in we are sure that the compressor and coils are large enough to meet all requirements, and we know that the system is going to balance.

"We hear a lot in this section about wildcat competition in the commercial field, but it does not affect us. We do a good job at a good profit, or we will not touch the work.

"Because of the quality of our work on the original installation, service is not a problem. We have a large number of Kelvinator installations in this area that have not been touched in a long time, and should not require attention for years to come."

10 Cold Storage Plants for Farms in Mississippi Do Overflow Business

JACKSON, Miss.—A detailed report on the operation of 10 cold storage plants constructed throughout the state at a cost of $245,469 of federal WPA, county, and local funds, has been completed by E. H. White, director of the state's extension department.

Although only one of the plants was placed in operation before July 1, 1937, the 10 plants now in operation had handled more than a half million pounds of pork, beef, eggs, potatoes, and miscellaneous items up to Jan. 1, 1938, the report stated, and had resulted in large savings to farmers.

Volume of two plants was so great that they were forced to write to farmers requesting them not to bring in any more products for storage until notified.

The plants are located at Brandon, Booneville, Clarksdale, Decatur, Grenada, Hattiesburg, Houston, Indianola, Senatobia, and Poplarville. An eleventh plant, at Hazlehurst, is expected to be opened shortly.

Mr. White reported that 368 cases of eggs which were stored in the Hattiesburg plant when eggs were selling for 12 cents a dozen were sold during September and October at an average of 34½ cents a dozen. Storage and handling costs were less than 2 cents a dozen.

The Hattiesburg plant had a similar experience with Irish potatoes which were placed in storage in June when prices were down to 65 cents a hundred pounds, and were sold later for $1.65 per hundred pounds. While the temperature in the room in which the potatoes were stored could not be kept as low as desirable, only about 10% of the potatoes were lost from decay.

The Clarksdale plant, which opened July 15, 1937, has handled 87,970 lbs. of pork, 85,195 lbs. of beef, and over 50,000 lbs. of other products. The plant paid all operating costs.

The plant at Poplarville has handled 90,000 lbs. of beef, and has cured 40,000 lbs. of pork for farmers, although it did not open until the middle of November. The Indianola plant, which also opened in November, already has cured 75,000 lbs. of pork. The Brandon plant has cured 50,000 lbs. of pork since it opened last November.

Title to all plants is vested in Mississippi state college, and they have been leased by the state extension department to legally organized cooperative associations of farmers formed under the state's agricultural association laws.

Hussmann-Ligonier Uses 'Sales Magnet' Display in New Line

ST. LOUIS — Hussmann-Ligonier's 1938 lines of refrigerated display counters, reach-in refrigerators, institutional refrigerators, and market coolers, and a new fish case were introduced recently at a three-day convention here.

Line of display counters includes the following types: single shelf top display, two-shelf double duty, and business builder double duty, classified respectively as models ST, DX, and BB.

All three embody Hussmann-Ligonier's new feature known as "Sales Magnet Designed Display," intended to emphasize the display of foods.

Models ST and DX are almost identical in external appearance and size, the only outstanding differences being that the DX has an additional shelf in the upper part of the interior, and that the back of the ST is sloped at a sharper angle.

Both have acid-proof porcelain tops, stainless steel lined mahogany baffle pans, and Flexseal insulation sealing, and are equipped with "Humidicoils."

The "Business Builder" is a 6-foot display case with a 2-foot addition at one end housing the compressor compartment.

Features incorporated in the two standard-type cases are included in the BB model, which can be used in restaurants, delicatessens, small food stores, bakeries, and similar commercial enterprises.

Five models comprise the line of reach-in refrigerators, although there are only two types of cabinets. Overall height of all models is 83 inches.

Smaller of the two types of cabinets is that of models 853 and 854. It has a full-length compartment on one side of the center beam, and two half-size compartments on the other, all with glass-paneled doors.

The larger cabinet, diversified as models 850, 855, and 856, is in three vertical sections, the left-side one being a full-length compartment, and the center and right sections each having two half-size compartments.

Hussmann's institutional refrigerators are models R-863, R-864, R-865, and R-866. Like the reach-in boxes, these models are in two cabinet types.

In fact, the cabinets are identical with the reach-ins with the exception that the doors are not glazed.

The 1938 Hussmann walk-in cooler line consists of seven models, all 8 ft. 6 in. high with more than 6 ft. 2½ in. of clear head room.

They are finished in white "Bondurbrite" with black trim, and are equipped with the Humidicoil type cooler.

An addition to the line is a completely enclosed storage cooler with a front door.

Hussmann's new 6-foot self-contained fish and utility case, with freezer, is similar in design to a beverage cooler, with three sliding glass doors in the slightly sloping top.

It is insulated with 2 inches of corkboard around the display compartment in the top, sealed with Flexseal.

Refrigeration for the fish case is provided by a heavy-duty, ⅓-hp., Hussmann compressor enclosed in a compartment next to the freezer.

Coils in the display compartment are in the walls and floor.

New Hinges & Latch Introduced by Kason

BROOKLYN—Production of two new forged-brass hinges and a forged-brass latch for refrigerators has been announced by Kason Hardware Corp.

Featuring the Kason adjustable handle, the door latch, called K-72, is adaptable to all types of refrigerators.

In polished brass or polished nickel, the K-72 latch is priced at $3.20.

The new Kason hinges, models 1010 and 1011, are similar in design, with 6½-inch straps and holes drilled and countersunk for No. 11 screws.

Model 1010 has an overall length of 7¾ inches, one fourth of an inch longer than model 1011.

With polished brass or polished nickel finish, the 1010 hinge is priced at $33.50 per dozen pair. Price for chrome-plated hinges is $37.50 per dozen pair.

In polished brass or polished nickel, model 1011 sells at $32 per dozen pair.

Cabinet Is Specially Designed to Test Water Samples

CLEVELAND—Restyled to meet a variety of exacting scientific requirements, a General Electric household refrigerator has been installed in the laboratory of the new WPA easterly disposal plant here under the direction of Ted Eberwine, of the commercial division of General Electric Supply Corp.

Mr. Eberwine was told by the chemists of the laboratory that they needed an incubator-refrigerator to conduct tests for biochemical oxygen demand in which water samples must be held at a constant temperature of 20° C. (68° F.) for five-day periods.

It was required that temperature variance must not exceed one degree above or below 20° C. during the five days, and that the refrigerating unit must be so sensitive that it cuts in and out at the variance of one half of one degree.

Mr. Eberwine installed a Bristol thermometer controller with switches and relays in a G-E B-8 refrigerator, housing the mechanism in a specially made case attached to the top.

Upper section of the interior was baffled off so that the evaporator could operate at its proper below-freezing temperature.

The rest of the cabinet interior was transformed into an incubator, and a movable fan was placed in it. An interior lamp of small wattage was installed to supply heat when necessary. The machine was wired and assembled by the service shop at General Electric Division Co.

A three-way tumbler relay switch attached to the Bristol thermometer controller makes it possible for the unit to operate as a regular refrigerator.

W. F. Schade, city chemist, expressed satisfaction with the operation of the G-E B. O. D. Incubator, as Mr. Eberwine calls his machine.

Pre-Cooling Plant for California Planned

RIALTO, Calif. — A pre-cooling plant for fruits and vegetables soon will be built here at an approximate cost of $70,000 by Union Ice Co. of San Francisco.

A "Baptism of Fire" controls the hardness and durability of Servel crankshafts.

HARD AND TOUGH!

Long life and uninterrupted service are painstakingly built into Servel crankshafts.

They're tough—and hard—with wear-resisting bearing surfaces that outlast years of heavy-duty use.

Starting with highest quality steel forgings, Servel's superior methods of crankshaft processing are based on precision machine work and scientific heat-treating—with rigorous inspection at every step.

If you're looking for a dependable solution to your refrigeration or air conditioning problems, write to Servel today.

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ELECTRIC REFRIGERATION AND AIR CONDITIONING DIVISION

EVANSVILLE, INDIANA

MATERIALS...MACHINES ...MANPOWER

ROUGH MACHINING — Forgings are rough-machined to their approximate size before heat treating.

GRINDING — After hardening (large photo), bearing surfaces are precision ground to exact dimensions.

INSPECTION — Servel crankshaft hardness is held to close limits by both scleroscope and Rockwell tests.

Air Conditioning

More Germs in Schools Than in Subways, New York WPA Engineers Discover

NEW YORK CITY—Forty thousand samples of atmospheric impurities collected by a hundred scientists and engineers reveal that large quantities of dust, pollen, fumes, smoke, and bacteria are present in the air of New York City and that more germs congregate in the city's school rooms than in its subways.

The scientists and engineers, employes of the Works Progress Administration, were selected from relief lists to make the series of important air pollution studies for the benefit of the city.

Samples of air were obtained from all manner of sources: streets, subways, and alleys; school rooms, hospitals, theaters, and homes. Day after day the research group made their rounds, armed with the most advanced type of scientific instruments for testing air.

When the findings were released, schools took steps to repair ventilating equipment.

It also was learned that dangerous bacteria swarm in some Manhattan hospitals. These institutions have started to improve air cleaning apparatus.

The investigators found that germs and other impurities invade those theaters which do not have ventilating systems.

Lastly, they found that the air in slum areas, well known to be breeding places of disease, teems with bacteria and impurities of all sorts.

Work on the New York air pollution survey was directed and sponsored by municipal bureaus and by several colleges. Several instruments were used for the first time on these projects and proved to be valuable contributions to science.

One unique instrument known as the "portable germ-catcher" was among the new products tested by the WPA workers. According to the WPA it instantly records the germ composition of the atmosphere.

Another instrument, the peroxide gauge, developed by the British Meteorological Commission to determine the acid content of air, had never before been used in the United States.

The research workers operated out of several laboratories. One crew concentrated on smoke and similar nuisances, another on acids, a third on bacteria, and a fourth on air pollution in relation to sun rays.

The smoke survey required continuous readings from 64 roof-tops and from a series of street stations. The specimens collected at these points were analyzed for tar and for dust, for pollen and various gases.

In the course of their regular duties the workers reported to the health department violations of the city regulations which govern the use of fuel-burning equipment. Under the law, offending mills and plants must install smoke abatement apparatus.

The investigation pointed out that smoke damages paint and other types of building surfaces, and causes business a large annual loss for excessive window washing.

2 Residence Jobs Boost Oklahoma City Total

OKLAHOMA CITY—Two all-year air-conditioning systems were sold in Oklahoma City during December, according to reports made to Oklahoma Gas & Electric Co., bringing the year's total to 194 installations aggregating 2,110 hp., compared to 160 jobs, totaling 1,530 hp., in 1936.

Both of the December installations were for residences, the first, totaling 25¾ hp., and the second totaling 9½ hp.

Including evaporative cooling installations, number of cooling jobs on OG&E lines at the end of 1937 totaled 682, aggregating 7,793 hp.

Paper Problems of Pressroom Solved By Conditioning

CLEVELAND—Complete air conditioning is the final step in the solution of pressroom paper problems, according to an article by Hans H. Gugler, of H. H. Gugler & Associates, Chicago, which appeared in a recent issue of Paper Progress.

Not only is air conditioning a perfect panacea for paper problems, says Mr. Gugler, but such installations eliminate many other problems, particularly in lithograph plants.

"Astute craftsmen and engineers," the article says, "have estimated that an air-conditioning system will show a saving of $8 to $10 per press per 8-hour shift in lithographic plants, and $4 to $6 in letterpress plants as a result of greater press capacity, in speed, avoidance of 'down' time due to paper troubles, an approximate 10% ink saving from lighter impressions possible, and other miscellaneous factors.

"Under such self-liquidation, it is logical to assume that as printing steers its way out of the financial doldrums, air conditioning will become much more common than it is today."

Mr. Gugler lists three other steps followed by the printing industry in trying to solve paper problems, namely trial-and-error methods of shop operation, protection of paper in storage, and humidity control.

Great majority of print shops still rely on the second step, Mr. Gugler asserts, although many of them are adopting humidity control. A very small percentage of the industry has advanced to the fourth step, air conditioning, because of the cost.

TRIAL-AND-ERROR METHODS

In the trial-and-error methods, Mr. Gugler includes such widely used practices as racking paper in small lifts, slip-sheeting, gas drying, sprinkling pressroom floors, and running sheets through a press without a form.

To supplement such elementary tricks, Mr. Gugler says, precautions with respect to the paper itself came into wide-spread practice.

"These precautions," the article states, "while by no means a solution, are part of one, and are just as important in conjunction with the most modern humidity and temperature control systems as they were when first advocated by progressive students of paper problems.

"The principal ones include keeping paper in its sealed containers until its temperature is the same as that of the pressroom in which it is to be used; keeping paper in its original package until ready for use; keeping windows shut during rainy weather to minimize humidity changes in the pressroom; and protecting stored paper from extremes of heat and cold."

HUMIDITY CONTROL

Mr. Gugler states that the third step, humidity control, is the one to which most progressive printers have now advanced, but that it is widely misunderstood.

Crux of the matter is the fact that even if relative humidity is maintained constantly, changes in room temperature will cause alternate variations in moisture loss, and will affect the paper's physical properties.

"There is a wide variety of humidity control equipment available," says Mr. Gugler, "and a wide range of capacities and prices. The simplest form is the straight atomizer, usually costing about $200.

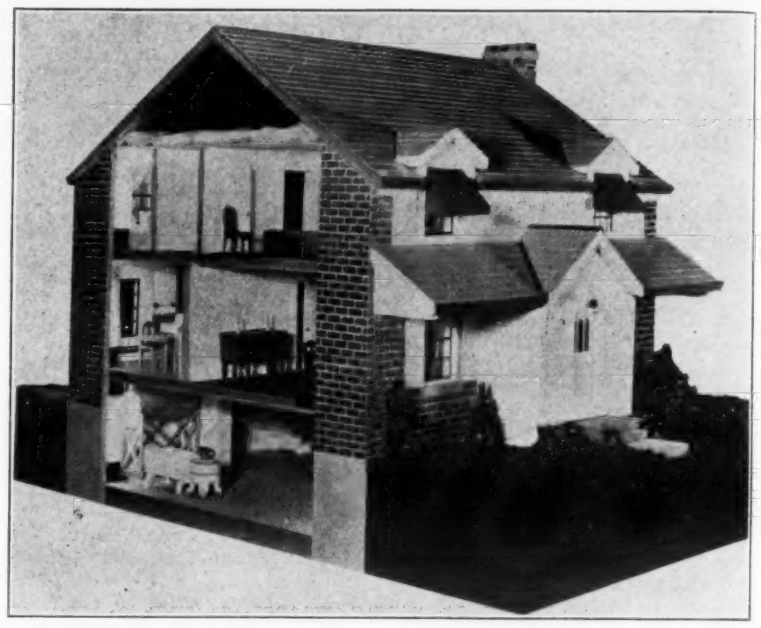
"This device has a revolving disc and an atomizer producing a very fine spray for diffusing moisture around the pressroom. The next device is the air-wash type of humidifier, which draws air from outside.

"A third type is a four-blade device, utterly simple in construction, which works on the spray principle of the atmoizer, but which has an automatic regulator for controlling the amount of water admitted to the spray.

"A fourth type is the cooling humidifier, a dry system, which controls relative humidity by controlling temperature."

The principal paper troubles for which all these attempts have been made, Mr. Gugler says, are caused primarily by the effect of changing humidity on paper.

'Doll House' Model of Kelvin Home



The "Doll's House Model" Kelvin Home as visitors to the recent International Heating and Ventilating Exposition in New York saw it in the Kelvinator booth. In addition to year-around air conditioning with automatic heating, an electrical laundry and an all-electric kitchen are reproduced in this miniature home. Plans are being made to display it in various home shows throughout the country.

Many Unusual Uses of Air Conditioning Were Reported in 1937

Refrigeration & Air Conditioning Institute
2150 Lawrence Ave., Chicago

Editor:

From time to time we have noticed articles in your publication describing new uses for air-conditioning equipment—in other words, unusual applications of air conditioning.

Would it be possible for you to send us tear sheets of these articles from time to time, or could you advise us of such articles in previous issues which we may have overlooked.

We would be very appreciative of any cooperation you could give us in this matter, as we are, of course, desirous of keeping up with the new developments in this industry.

TERRY P. CUNNINGHAM,
Director of Advertising.

Answer: Following is a list of such stories published during the past year, the list being an index in the form of the headline and the issue and page number.

Not all of the stories deal with brand new applications, of course, but where the application is not entirely new, there is usually some angle to the application that is novel.

Best method of checking on future new applications of air conditioning is to read carefully each issue of AIR CONDITIONING & REFRIGERATION NEWS as it is received at your office.

The list is as follows:

"Extended Use of Air Conditioning Is Seen in Disease Treatment"—Jan. 6, page 22.

"How Air Conditioning May Extend Life of Library Books Outlined in Research Foundation Study"—Jan. 13, page 21.

"Conditioning Extends Mushroom Season"—Jan. 27, page 14.

"Carrier Gets $100,000 Contract to Air Condition Arizona Copper Mine; First Underground Installation Made in U. S."—Feb. 10, page 20.

"Air Conditioning Is Aid in Speeding Up Match Production"—Feb. 24, pages 24 and 25.

"Brine Spray Air Washer Conditioning System Maintains Low Temperatures in Hide Storage Room of Canadian Tannery"—March 3, page 19.

"Kelvinator Introduces Automatic Conditioner for Passenger Buses"—March 17, pages 1 and 15.

"Malay Farmers Will Air Condition Cows to Get More Milk"—March 24, page 14.

"Air Conditioning in the Steel Mill" (Air Age)—April 28, page 15.

"Air Conditioning by Doctor's Prescription" (Air Age)—May 5, page 13.

"Denver Cleaner Expects Conditioning Will Show Dollars & Cents Return"—May 12, page 10.

"Kelvinator System Comforts Dogdom"—May 12, page 13.

"Agfa Ansco Corp. Conditions New $265,000 Binghamton Film Warehouse"—May 19, page 19.

"Doctor Predicts Animal Air Conditioning"—May 26, page 11.

"Portland Puppy Laundry Now Air Conditioned"—May 26, page 11.

"Air Conditioning Helps Breed Mosquitos for Hospital Research"—June 2, page 7.

"American Airlines Buys Equipment to Condition Planes Standing at Airport"—June 9, page 7.

"Air Conditioning Aids in Transporting 'Iron Lung' Patient from China"—June 23, page 1.

"Conditioned Dormitories Give Hay Fever Sufferers Relief"—June 30, page 9.

"First Successful Tent Air Cooling System Used by Circus"—June 30, page 9.

"Deluxe Tourist Cabins Now Air Conditioned"—July 7, page 8.

"Laboratory Conditions Soil Specimens"—July 7, page 8.

"Use of Air Conditioning in Medical Test Rooms Outlined by Mayo Surgeon"—July 14, page 13.

"Air Conditioning Will Keep These Cows Contented"—Aug. 11, page 1.

"Air-Conditioned Sleeper Bus on Bagdad Run"—Aug. 11, page 15.

"Carrier System Simulates Cave Conditions at Fair"—Sept. 1, page 6.

"Air-Conditioning System Aids in Restoring Colonial Church to Original Appearance"—Sept. 8, page 13.

"'First Auto Air Conditioned for Winter Driving' to Be Previewed Monday by Nash Dealers"—Sept. 29, page 1.

"Summer Layoffs in Copper Mine Eliminated by Installation of Air-Conditioning System"—Oct. 27, page 9.

"Conditioning Used to Produce Paper"—Dec. 8, page 19.

"Doctors Study Correct Air Conditioning for All Operations"—Dec. 8, page 20.

"Windowless Factory Built for G-M Laboratory"—Dec. 8, page 20.

"Air-Conditioned Dark Room Used by Survey Group"—Dec. 8, page 20.

"Cooling System Installed in Art Gallery"—Jan. 5 (1938), page 15.

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GR COMMERCIAL REFRIGERATION
GR engineers constantly are developing new equipment to meet difficult refrigeration and comfort cooling requirements.
GR AIR CONDITIONING
Send your problem to GR-Lipman engineers for their recommendations.
GENERAL REFRIGERATION CORPORATION
Dept. F-1, Beloit, Wisconsin, U.S.A.

Where Air-Conditioning Systems Were Installed in Indianapolis in 1937

(Compiled by Indianapolis Power & Light Co.)

Name and Address	Make of Equipment	Hp.	Tonnage
Beauty & Barber Shops			
Central Beauty College, 209 Odd Fellow Bldg.	Climax	1.1	1
Columbia Club Barber Shop, 121 Monument Circle	Climax	2.0	2.2
Roberts, Stanley & Thomas, 420 Guaranty Bldg.	Kelvinator	2.5	2
Doctors and Dentists			
Gant & Gant, 1215 Roosevelt Bldg.	Ackeraire	.33	.33
Dr. Damon Good, 600 E. Maple Rd.	Climax	1	1.1
Dr. Harry R. Kerr, 2817 E. Washington St.	Climax	.5	.6
Dr. Robert K. Walker, 710 E. 46th St.	Climax	0.5	0.6
Dr. A. S. Woodard, Jr., 656½ Fairfield Ave.	Climax	.5	.6
Hospitals			
Methodist Hospital, 1604 N. Capitol Ave...			
Addition to system	Frigidaire	33.0	28.0
Addition to system	Frigidaire	3.0	3.0
Patient room	Climax	0.5	0.6
City Hospital, 960 Locke St.	Carrier (gen. own power)	33.0	38.0
Industrial Applications			
Frozen Produce Co., 601 Fulton St.	York	10.0	8.0
Omar Baking Co., 901 E. 16th St.	Lipman	8.0	8.0
Offices, General			
Advance Independent Electrotype, 730 E. Washington	Kelvinator	5	5
Advance Paint Co., 525 W. Abbott St.	Kelvinator	18	15
American Foundry Co., 1535 Naomi St.	Airtemp	6	6
American States Ins. Co., 542 N. Meridian St.	General Electric	3	0
Banner Whitehill Co., 31 S. Meridian St.	Frigidaire	3.5	3.0
Barbasol Co., 846 N. Senate Ave.	Ilg	23	20
Chamber of Commerce Bldg. Office, 320 N. Meridian St.	Westinghouse (addition)	1.5	1
Geo. O. Desautels, 335 Postal Station Bldg.	Airtemp	3	3
Guarantee Tire & Rubber Co., 211 S. Illinois St.	York	5.75	5.0
W. J. Holliday & Co., 525 W. McCarty St.	Climax	2.0	2.0
Addition to system	Climax	10.75	12.1
Indiana Oxygen Co., 435 S. Delaware St.	Carrier	12.0	10.0
Inland Container Corp., 700 W. Morris St.	York (combination sys.)	47.5	25.0
Link-Belt Co., 515 N. Holmes St.	Airtemp (combination)	21	18
Milligan Oil Burner Co., 1553 N. Meridian.	Airtemp	3.0	3.0
Refrigerating Equipment Corp., 931 N. Meridian St.	Frigidaire (addition)	5.0	5.0
Schwitzer-Cummins Co., 1125 Massachusetts Ave.	Frigidaire	32	30
U. S. Corrugated Box Co., 1409 Roosevelt.	Lipman	23.0	10.0
Offices, Private			
American States Insurance Co., 542 N. Meridian St.	General Electric	1.0	0.7
Anderson Chevrolet Co., 3759 N. Illinois St.	Frigidaire	1.0	1.0
Emory Baxter, 445 N. Pennsylvania St.	General Electric	2.5	2
A. Borinstein Co., 207 S. East St.	Carrier	.75	.7
R. D. Brown, 309 Postal Station Bldg.	Frigidaire	.75	.75
Ray Cooper, 204 Occidental Bldg.	Climax	.5	.6
Herff-Jones Co., 1411 N. Capitol Ave.	Carrier	.75	.7
Ertel Machine Co., 1420 E. 20th St.	Climax	1.0	1.1
Hume-Mansur Bldg. Co., 23 E. Ohio St.	Carrier (air cooled)	0.75	0.7
Ideal Furniture Co., 227 W. Washington St.	Climax	0.5	0.6
Indianapolis Power & Light Co., 17 N. Meridian St.	Airtemp	1.5	1.1
Metal Auto Parts Co., 1428 W. Henry	General Electric	1.5	1.5
J. W. Mull, Jr., 839 Architects Bldg.	Climax	1.0	1.1
Necor, Inc., 3rd Floor, State Life Bldg.	Carrier	1	.75
Sanborn Electric Co., 309 N. Illinois St.	Westinghouse	1.6	1.0
V. E. Sprouse, 739 E. Market St.	Climax	1.0	1.1
Residences and Room Units			
Frederick M. Ayers, 5700 Sunset Lane.	Carrier	.75	.7
Carl E. Bick, 5707 Washington Blvd.	Carrier (air cooled)	0.75	0.7
R. C. Block, Traders Point, Ind.	General Electric	3	2
A. L. Borinstein, 4155 N. Meridian St.	Carrier	.75	.7
W. Stuart Busey, 17 E. St. Joseph St.	Kelvinator	.5	.5
J. C. Consodine, 5560 Washington Blvd.	Frigidaire	0.75	0.75
Warren Curry, 1001 College Ave., No. 314.	Climax	0.75	0.9
C. A. Edwards, 4156 N. Meridian St.	Kelvinator	1.5	1.5
P. P. Effroymson, 2809 N. Pennsylvania St.	General Electric	0.5	0.5
Bowman Elder, 350 N. Meridian St.	General Electric	1	1
R. G. Facre, Speedway City, Ind.	Climax	.75	.9
W. A. Hanley, 4050 Washington Blvd.	Carrier	.75	.7
Omar S. Hunt, 5737 Wildwood Ave.	Frigidaire	3.25	3.0
H. Intermill, 2625 N. Meridian St.	Carrier	.75	.7
Raymond P. Jenkins, Speedway City, Ind.	Climax	1.5	1.8
Kelvin Home, 5511 Kenwood Ave.	Kelvinator	1	.75
Robert J. Kryter, 5126 W. 16th St.	Climax	.75	.9
J. K. Lilly, Jr. Traders Point, Ind.	Frigidaire	11.5	10.5
T. A. Myers, 28 N. Webster St.	Climax	0.5	0.5
H. S. Pierce, 3255 Washington Blvd.	Airtemp	1.5	1.1
Mr. Reed, 5156 N. Illinois St.	Airtemp	3.0	3.0
G. W. Sanborn, 4701 Michigan Rd.	Westinghouse	0.75	0.75
Howard Schurmann, 3540 N. Pennsylvania	Climax	0.5	0.6
Restaurants			
Canary Cottage, 48 Monument Circle.	Westinghouse (evap. con)	43.0	35.0
Charley's Restaurant, 144 E. Ohio St.	Frigidaire (addition)	10.0	10.0
Claypool Coffee Shop, 108 W. Washington	Frigidaire	25.0	20.0
Downey Flake Doughnut Shop, 136 Monument Circle	Airtemp	6.0	6.0
Ruch Doughnut Shop, 105 N. Illinois St.	Airtemp	3.0	3.0
Stratford Hotel Restaurant & Bar, 126 W. Market St.	General Electric	11.5	10.0
Stores			
Argus-Yaver Haberdashery, 36 N. Pen'vania	Climax	1.0	1.1
L. S. Ayres & Co., 1 Washington St.	Carrier (addition)	21.5	20
Baker's Shoe Store, 38 W. Washington St.	York	13.0	10.0
Burts' Shoe Store, 39 E. Washington St.	York	11.0	10.0
Carroll Perfumers, 52 Monument Circle.	Airtemp	3	3
Florsheim Shoe Shop, 2 E. Washington St.	Carrier	5.25	5.0
W. T. Grant Co., 25 E. Washington St.	Carbondale	73.0	60.0
Indiana Fur Co., 29 E. Ohio St.	Frigidaire (addition)	10.5	10.0
H. H. Mayer, Inc., 42 W. Washington St.	Carrier	18.0	15.0
R. & H. Miller Dress Shop, 26 W. Wash'ton	Frigidaire (evap. con.)	47.0	40.0
Miller Jewelry Co., 29 Monument Circle.	Airtemp	3	3
Maud Muller Candy Shop, 102 Monument C.	Frigidaire	1.5	1.5
Sears, Roebuck & Co., 351 N. Alabama St.	York	268.0	160.0
H. P. Wasson Co., department store, 2 W. Washington St.	Carrier (addition)	3.0	0.0
Studios			
WFBM Studios, 48 Monument Circle.	Westinghouse (addition)	9.0	8.0
Theaters			
Alamo, 152 N. Illinois St.	(well water system)	7.5	0.0
Ambassador, 113 N. Illinois St.	Well Water	5	0
Belmont, 2043 W. Washington St.	Westinghouse (comb'n)	25.5	15
Cinema, 213 E. 16th St.	(well water system)	12.5	0.0
Emerson, 4630 E. 10th St.	(well water system)	10.0	0.0
Fountain Square, 1104 Prospect St.	(well water system)	45.0	0.0
Garfield, 2203 Shelby St.	Well Water	5	0
Grove, Beech Grove, Ind.	Well Water	7.5	0
Irving, 5507 E. Washington	(well water system)	15.0	0.0
Oriental, 1105 S. Meridian St.	(well water system)	37.5	0.0
Ritz, 3430 N. Illinois St.	(well water system)	7.5	0.0
Rivoli, 3155 E. 10th St.	Well Water	5	0
Speedway, Speedway City, Ind.	Well Water	10	0
St. Clair, 800 Ft. Wayne Ave.	(well water system)	30.0	0.0
Strand, 1332 E. Washington St.	(well water system)	22.5	0.0
Talbott, 2145 N. Talbott Ave.	Westinghouse	25.5	15.0
Undertakers			
Farley Funeral Home, 1604 W. Morris St.	Climax	2.0	2.2
Flanner & Buchanan, 25 W. Fall Creek Bl.	Frick	26.0	15.0
Hermann Funeral Home, 1505 S. East St.	Climax	4.0	4.4
Roscoe Conkle, 1934 W. Michigan St.	Climax	4	4.4
Hisey & Titus, 951 N. Delaware St.	Kelvinator	9	7.5
Harry W. Moore, 2050 E. Michigan St.	Climax (addition)	1	1.1
Moore and Kirk, 2530 Station St.	Climax	3	3.3
Totals		1,070.60	669.20

Kelvinator Issues Report For Final '37 Quarter

DETROIT—At a recent meeting here Nash-Kelvinator Corp. directors declared a dividend of 12½ cents per share, payable Feb. 21 to stockholders of record Jan. 31. This compares with a dividend of 25 cents paid in previous quarters.

Loss in the quarter ending Dec. 31, 1937, was $783,046, ascribed by the company to the general business decline, and other extraordinary expenses incident to the temporary curtailment of Kelvinator operations through introduction of its new mechanical unit, as well as large advertising and promotional expenditures publicizing the new Nash cars. Seasonal low of refrigeration business during the quarter also was named as a contributing factor.

Dividend policy should be in line with earnings and general business conditions, particularly in view of the corporation's expansion program, directors stated.

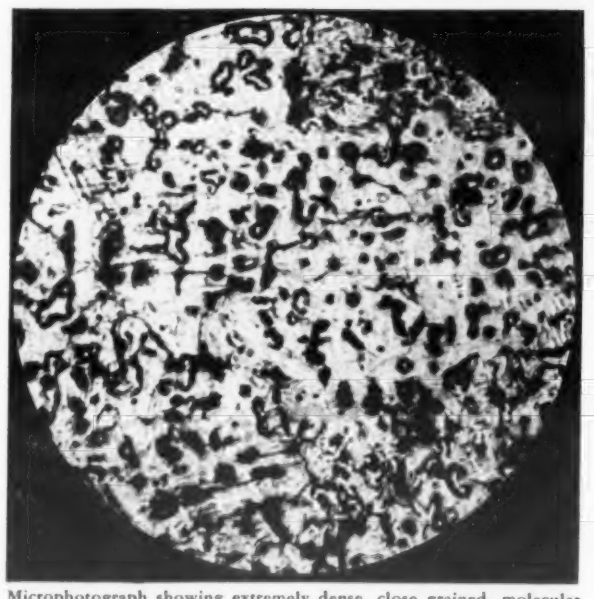
Nash operations showed up satisfactorily until the latter part of November, when sharp curtailment occurred. Shipments for the last quarter, however, were 20,194, compared with 20,497 for the same 1936 period.

George W. Mason, president, notes signs of increasing volume and improving business, although he said that business has been unsatisfactory for some weeks.

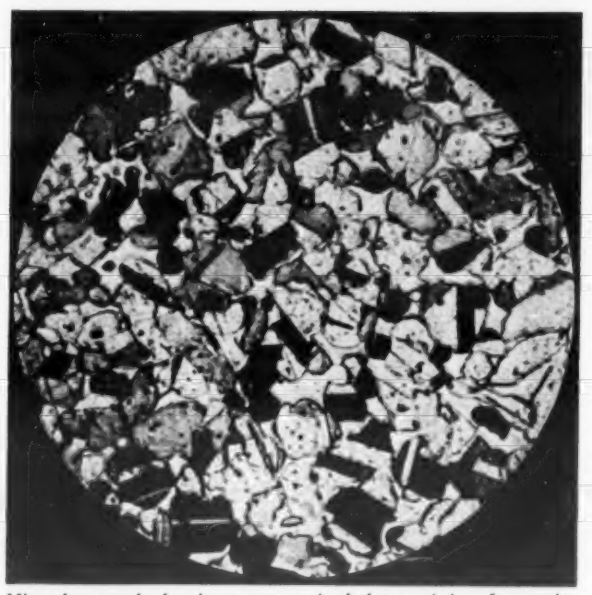
No accurate comparison of current loss with that for the same period of the preceding year is available, owing to adjustments of fiscal periods of the divisions of the corporation.

Micro-photographs

SHOW UP FEDDERS EXTRA QUALITY.....



Microphotograph showing extremely dense, close grained, molecular structure of Fedders Drop Forged Valve Bodies assuring proof against seepage leaks.



Microphotograph showing coarse grained characteristics of cast valve body as contrasted to impervious density of Fedders Drop Forged body.

Microphotographs by Pittsburgh Testing Laboratory—Magnified 150 Diameter

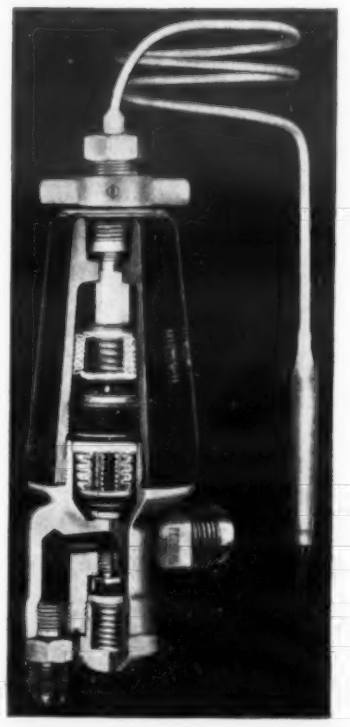
FEDDERS DROP-FORGED VALVES cut service costs

● There can be no such thing as seepage leaks, thanks to Fedders DROP FORGED brass valve bodies. Look at these microphotographs and see the contrast between the close grained metal structure of Fedders DROP FORGED valve bodies and that of coarse grained cast valve bodies.

The micro-photograph at the left shows the dense, homogeneous structure of Fedders DROP FORGINGS. The high forging pressures produce valve bodies of such compact molecular structure that they are absolutely impervious to penetrating refrigerant gases from the inside and moisture from the outside.

Other Extra-Quality features include exclusive interchangeable power element, bellows, tube and bulb assembly, high vapor charge providing positive control through the entire temperature range, hermetically sealed power element housing, convenient, sensitive adjustment without the use of tools, moulded housing, push pin and guide insulating body from power element.

Refrigeration men in every part of the world have proved and approved Fedders Model 33 Thermostatic Expansion Valves by 5 years of on-the-job performance on thousands of installations. Sold by Representative Suppliers everywhere.



FEDDERS MANUFACTURING CO. BUFFALO, NEW YORK

Atlanta - Boston - Chicago - Cincinnati - Dallas - Detroit - Los Angeles - New York - Philadelphia

ARE YOU GETTING YOUR COPY OF THE FEDDERS NEWS?

Service Methods

Service Men Can Make Real Money by Merchandising Replacement Parts and Accessories in Winter 'Call-Backs'

BY K. M. NEWCUM

How to hold a service organization together during the winter months and provide an income for these men without eating into last summer's profits is an important problem of dealers, distributors, and service organizations at this season of the year.

Sale of new equipment is slack, hence installation work is at a minimum. General service work is below par, principally because minor irregularities in the refrigeration system do not as seriously affect the refrigerator temperature during cold weather as they do in hot weather.

During hot weather almost any unusual condition, a slight rise in refrigerator temperature or a strange noise, results in a service call. During cold weather users are not so conscious of their refrigerators, and usually do not call for service unless the system completely breaks down.

Net result is lots of service men working long hours in the summer, fewer men working shorter hours and generally at reduced incomes during the winter.

Management alone should not be blamed for this winter ebb. Management can't force users to call for service, or force salesmen to sell more jobs, just to keep the service man employed and busy. Like any labor problem it requires cooperation between management and the service man.

Here's an idea. A large manufacturer of refrigerator door gaskets recently complained of a very noticeable drop in door gasket sales to jobbers. He looks to jobbers for the bulk of his replacement sales business. He remarked, however, that they have a similar slump each winter.

Why he asked, shouldn't service men take advantage of this slump period to solicit individual jobs of regasketing household and commercial refrigerator doors?

There's lots of logic in this business man's question. Why shouldn't this be the opportune time to solicit jobs that are neglected in the summer because everybody is too busy to pay attention to them?

Management is cognizant of the unique acquaintance which service men have with refrigerator customers whom they serve. They realize that the service man can easily gain entrance to homes. Why then don't more employers take advantage of the profit and customer service opportunity that service men afford, by training a selected group of service men on the merchandising of regasket jobs, cold controls, new convenient trays, and other up-to-date features that could be sold to owners of older refrigerators?

A service man may be compared to a doctor. He is called upon when the patient is in trouble. By his ability as a technician he corrects the trouble and makes the refrigerator owner happy. Any suggestions and advice given to the user by the service man along the lines of improving the service obtainable from the refrigerator is considered expert. The housewife has a high regard for a man who can so successfully repair such a complicated piece of mechanism.

Now suppose that the service man appears at his customer's door this winter. Nine chances out of 10 the housewife will let him in without question.

In a very solicitous manner the service man informs her that he is going about making free inspection of the refrigerators in his territory, and asks if he may check her refrigerator.

The service man may, even before entering the kitchen, tell the housewife that, if his memory serves him correctly, her refrigerator door gasket is worn and that worn gaskets increase the electric bill.

He may say that he noticed this defect last summer, but was so busy that he forgot to mention it, and that now he has sufficient time to check the whole refrigerator for her at no charge.

There's a great possibility that the housewife can be sold a regasket job, which the service man should be prepared to do on the spot.

Maybe the job doesn't need new gaskets. Certainly, if the refrigerator is a few years old, it needs something.

Bear in mind that present refrigerator owners are the most careful readers of new refrigerator advertisements. They are familiar with eight-speed cold controls with a defrosting position, new rubber or easy-lift trays, and the other convenience features which, properly presented, can be sold for additions to their present refrigerators.

The service man should receive a commission on what he sells. Winter campaigns of this type have often resulted in merchandising-minded service men making more money from sales (refrigerators or accessories), than they normally make during the busy summer months.

Hints on Selecting Drives Given in New Books

EAST PITTSBURGH — Westinghouse Electric & Mfg. Co. has issued a new 12-page booklet entitled "Electric Drive Selector and Hints on Maintenance," describing and illustrating requirements which must be met in the selection of an electric motor.

Baltimore Service Firm Has New Quarters

BALTIMORE — Reliable Service Co., refrigeration, radio and appliance service organization headed by Harry S. Eklof, has moved to larger quarters at 1128 Cathedral St. The firm formerly was located at 16 E. Franklin St.

Alco Gives Engineering Advisory Service to Men in the Field

ST. LOUIS—To assist engineers and service men in the correct application of refrigerant controls to the many different types of refrigeration and air-conditioning jobs, Alco Valve Co., manufacturer of refrigerant controls, has prepared an engineering data sheet on which pertinent data may be tabulated and forwarded to the engineering department of Alco, which will determine, from the information supplied, the correct application of controls and advise the engineer accordingly.

The engineering data sheets may be obtained upon request direct from Alco Valve Co., or from their jobbers. Alco engineers believe that if all of the factors and problems concerning the installation are furnished they will be able to determine the correct application, and consequently assist the field engineer in avoiding needless service expense which might result from improper application of the controls.

Chicago Code Meets Requirements, Becomes Part of City's Law

CHICAGO—Chicago's revised refrigeration code, two years in the making, is now part of the law of the city. All legal requirements have been met, and the Department for the Inspection of Steam Boiler, Unfired Pressure Vessels, and Cooling Plants has made arrangements to enforce provisions of the new ordinance.

Gerald Gearon, supervising mechanical engineer of the department, is asking all organized groups in the city who are affected by the ordinance to cooperate in observing the new requirements, and to aid in enforcment of the code.

Speaking before a meeting of the Chicago Section of American Society of Refrigerating Engineers last week in the Drake hotel, Mr. Gearon thanked members for their help in formulating the new code, and asked their cooperation with the department in its educational and enforcement program.

'Fix-It' Time Inaugurated As Means of Keeping Service Men Busy

MANCHESTER, N. H.—To keep its service men employed during the slack period and to afford housewives an opportunity to have all their appliances reconditioned at "bargain" prices, Twin State Gas & Electric Co.'s appliance service department has inaugurated what it calls "fix-it time."

Large newspaper advertisements have been run to promote this new campaign. Service offered includes tuning up of all kinds of electrical appliances, from curling irons to home laundry equipment. Principal emphasis in advertisements is laid on price.

As an example, 25 cents is quoted as the labor charge for repairing an electric toaster. Special prices are offered for labor, as well as parts, on washer and ironer repairs.

Philadelphia A.S.R.E. to Hear About Insulation

PHILADELPHIA—Two talks by representatives of Johns-Manville and a sound picture on heat and its control, produced by the same company, are scheduled for the February meeting of the Philadelphia section of American Society of Refrigerating Engineers at the Engineers' club here Feb. 10.

"Heat Insulation Calculations" will be discussed by N. Allen Humphrey of Johns-Manville, and "Vapor, Water, and Insulation" by L. C. Leslie. Both talks will be illustrated with lantern slides. Discussions will follow both talks.

March meeting of the section will feature a talk on "Development of the Large High-Speed Refrigerating Machinery" by M. S. Lebair, branch manager of York Ice Machinery Corp., with general discussion led by L. S. Morse, past president of A.S.R.E. and of the local section.

Dr. Justus Goosmann Dies, Was Pioneer In Refrigeration

CHICAGO—Dr. Justus C. Goosmann, a leader in the development and application of carbon dioxide in refrigeration, died in Grant hospital here Jan. 21 after an extended period of failing health. He was 69 years old.

Born May 21, 1868, in Schleswig-Holstein, Germany, Mr. Goosmann was a graduate of the Royal Technical Academy, Charlottenburg, Berlin. After his graduation he joined the engineering staff of Siemens & Halske Co. of Charlottenburg, with the privilege of part-time employment at the Reich Physical Testing Laboratory, located adjacent to the Royal Academy.

In 1893 he came to Chicago as an engineer for the World's Columbian Exposition, remaining in this country with his company, as head of the testing laboratory. Later he accepted a position as designing engineer for the Western Electric Co.

Then he became associated with Fred W. Wolf, manufacturer of the Wolfe-Linde refrigerating compressors, in 1897, and later was associated with Fred Wittenmeyer in introducing carbon dioxide refrigeration. In 1903, he joined Witteman Bros. Co., Brooklyn, and the next year, in cooperation with Oswald Gueth, started a technical journal covering various phases of the carbonic acid industry.

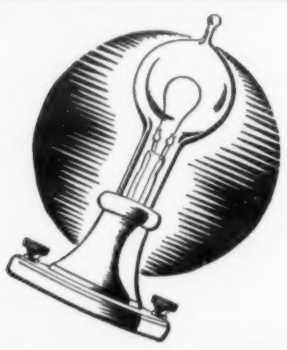
Returning to Chicago, Mr. Goosmann joined Kroeschell Bros. Ice Machine Co. as an engineer and salesman, and later set up his own engineering and contracting office here.

In 1927, he entered the services of the Frick Co. to help design a new type CO_2 compressor and system. First complete system with this new enclosed compressor type was completed, tested, and put into service during the summer of the same year. In 1930 he assumed the position of technical director for the Solid Carbonic Co., of which F. A. Rogers was then president.

His contribution to the development of carbon dioxide exceeds 20 inventions, of which many are in everyday use in practically every plant producing dry ice in quantity, as well as in the equipment field.

Since 1933, Mr. Goosmann had conducted his own carbonic engineering business, with headquarters in New York City and Chicago. He was a charter member of the American Society of Refrigerating Engineers.

He is survived by his widow, Ida Goosmann, and a daughter, Alice.



IS ACTIVATED ALUMINA ANOTHER INCANDESCENT *Lamp?*

(Before Incandescent Lamps were developed, electric light came only from awkward arcs. Edison's invention revolutionized the principle, brought electricity to home, office, and factory.)

THERE IS still much to be explored in applying the principle of Activated Alumina to air conditioning. Experience shows that Activated Alumina does have definite possibilities for application to industrial and home units.

This much is now established regarding it: 1. Activated Alumina has proved its economy for AIR CONDITIONING installations. 2. It adsorbs moisture from air efficiently; is inert and has good physical properties. 3. The use of Activated Alumina in reducing humidity for summer conditioning gives an invigorating atmosphere, never clammy or shocking. 4. Equipment using Activated Alumina controls humidity in process work as many industrial installations prove.

Are you interested? We will be glad to supply pertinent data. ALUMINUM ORE COMPANY. *Sales Agent:* ALUMINUM COMPANY OF AMERICA, 1908 Gulf Building, Pittsburgh, Pennsylvania.

ALORCO

ACTIVATED ALUMINA

FOR REDUCING HUMIDITY

The ANSUL TWINS

ANSUL CHEMICAL COMPANY

MARINETTE » » » » » WISCONSIN

MERCHANT & EVANS CO.
Phila., Pa., U.S.A. Plant at Lancaster, Pa.

Dayton V-BELTS

Silent, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.

THE DAYTON RUBBER MFG. CO., DAYTON, OHIO

World's Largest Manufacturer of V-Belts

KEROTEST

Valves and Fittings

The Standard of the Industry

Kerotest Manufacturing Co.
Pittsburgh, Pa.

Installation Methods

How Cooling Towers and Evaporative Condensers Operate; and an Operating Cost Estimate

NEW YORK CITY—Various types of cooling towers and evaporative condensers, and methods of estimating their water requirements, were described by S. I. Rottmayer, mechanical engineer on the staff of Samuel R. Lewis, in an address before the recent annual meeting of the A.S.H.V.E. here.

Familiar to all connected with the industry is the theorem that before the use of air conditioning can grow to the proportions hoped for it, fundamental changes must be made in the present practice of diverting two or three gallons of water per ton of refrigerating effect per minute from the city water mains (for which it has been purified at great cost), and dumping them down the overloaded sewer after having served no purpose other than that of being the conveyor for a few discarded B.t.u.'s.

"A successful and economical cooling tower must be capable of breaking up the incoming condenser water so as to present the largest possible surface to the air and at the same time bringing into intimate contact with this water the largest possible quantity of air for the least expenditure of power," declared Mr. Rottmayer.

FIGURING EFFICIENCY

"The extent of cooling is limited by the wet-bulb temperature of the air. Hence the efficiency of a device as a water cooler is expressed as a percentage as follows:

"Per cent efficiency = (hot water temperature — cooled water temperature) × 100 ÷ (hot water temperature — wet-bulb temperature of incoming air).

"Water cooling towers may be classified as:

"1. The atmospheric type which depends on wind motion for operation.

"2. The natural draft type, which employs stack or thermal action for producing air movement through the tower.

"3. The mechanical draft type, which employs forced or induced draft fans for creating air movement through the tower. The humidifying air washer is a modification of an induced draft cooling tower.

"4. The evaporative condenser, which is a combination of a refrigerating condenser and a mechanical draft cooling tower.

ATMOSPHERIC TYPE

"The **atmospheric tower,** called also open natural draft, deck type or wind tower is the most common type of tower installed for general refrigerating purposes, considering the number and tonnage of installations," said the speaker.

"It is constructed of wood or steel framing, adequately braced for wind stress, supporting a filling consisting of a series of horizontal decks or splash bars equally spaced from top to bottom. A system of louvers or large inclined shields at each deck level is supported by the outside of the framing.

"The water enters at the top through troughs, splash heads, or spray nozzles and descends from deck to deck to reach a basin at the foot of the tower. The function of the louvers or inclined shields is to prevent loss of water on the leeward side by deflecting the air upward, retaining the water particles blown against them. Vertical, staggered eliminators between the side shields also have been used to reduce further the windage losses or drift of the water.

"Increasing the height and length of a tower increases the area of water exposed to air, and increased width increases the length of time of contact of the air with the water.

"Since this type of tower depends for operation on natural air movement, it must not be located near obstructions which reduce wind contact and its long side must be at right angles to the prevailing winds. It should be designed to operate at capacity with a wind velocity of not more than 5 m.p.m. and with a wet-bulb temperature which is not exceeded during more than 5 to 8% of the season.

"Atmospheric spray towers are a modification of this type of tower in that the filling or decks are omitted and water is sprayed downward under pressure from nozzles.

"Atmospheric towers have advantages of low operating costs and low first cost. Disadvantages are the large size, great area and weight, as well as dependence on variable natural air movement. Spray towers require a higher pumping head and generally are lower in first cost than purely atmospheric towers.

"The efficiency of an atmospheric cooling tower will vary with its design and loading usually between limits of 35 and 90%. The usual atmospheric deck type tower has an efficiency of about 67% compared with about 50% for an atmospheric spray tower.

NATURAL DRAFT TOWER

"The **natural draft tower** has an air-tight shell enclosing the filler section with air inlets at its base and with its top extending as a chimney above the filler for a considerable distance.

"An upward flow of air from the bottom through the filler is produced by the difference in weight of air on the inside and outside of the tower, this weight responding to temperature; hence its use is confined largely to application having high entering water temperatures and long cooling ranges. Its performance is not greatly affected by wind velocity.

"A **mechanical draft cooling tower** differs from the natural draft type in that the chimney above the enclosing shell is shorter and air is circulated upward by means of fans located either at the bottom or at the top. A set of eliminator plates across the top of the tower is provided for removing entrained moisture from the departing air.

"A forced-draft tower has fans located at the base of the tower, where they can readily be inspected and serviced. Horizontal vanes may be installed inside the tower to deflect the incoming air evenly across the tower area.

"An induced draft tower has fans located above the eliminator plates at the high point of the tower. The fans in such a tower are subjected to the deteriorating effect of the moist air. This tower can be lower in height than the forced draft style for the same cooling results.

"Since the airflow is counter to the water flow, the efficiency of heat transfer of the mechanical draft tower is high. Air velocities over the gross area of the mechanical draft tower generally vary with the design of the tower between limits of 250 and 600 f.p.m.

"Mechanical cooling towers may be located within buildings or may be exposed outside. When installed within buildings, mechanical cooling towers may serve as exhaust fans for the ventilating system and may take all or part of the air from inside the building. This air may be cooler and more favorable for service than the outside air.

"An ordinary double spray humidifying air washer may be used within a building as a water cooler where considerable area but little head room is available. The high efficiency of counterflow heat transfer by the vertical mechanical draft tower is not present in this type of apparatus; hence a greater quantity of air must be handled.

FAN RECOMMENDATIONS

"Disk or propeller-type fans generally are used for producing air circulation in mechanical water towers located outside of buildings. Increasing the number of blades of these fans decreases the noise produced. Where particularly quiet operation is essential, housed centrifugal multiblade blowers usually are employed.

"Advantages of mechanical draft towers over atmospheric towers are independence of natural wind movement, smaller area and weight. Disadvantages are higher investment, maintenance, and operating costs.

"The efficiency of a mechanical draft cooling tower ranges between 35 and 90%, depending on its design and loading. The usual design has an efficiency of about 67%.

EVAPORATIVE TYPE

"The **evaporative condenser** combines an induced or forced draft cooling tower with a refrigerating condenser. Like an indoor cooling tower, it may take all or part of its air supply from inside the building, and hence may serve also as an exhaust ventilating fan.

"It is constructed generally with a single bank of spray nozzles wetting the extended coil surface of a refrigerant condenser built into the air passage. A bank of eliminator plates is interposed between the spray chamber and the leaving air.

"For periods of intermediate temperature during the spring and fall this apparatus may be operated without water as an air-cooled condenser.

"The quantity of make-up water required by each type of air-contacting equipment is equal to that lost by wind or drift plus that evaporated," explained Mr. Rottmayer.

"The loss in pounds of water through evaporation is equivalent to the quantity of heat to be dissipated, divided by the latent heat of vaporization at the temperature of evaporation, usually slightly above the wet-bulb temperature.

"The heat removed per minute in a refrigeration system is 200 B.t.u. per minute per ton plus additions due to leakage, friction, etc. and plus variable additions on account of the ratio of compression, character of the refrigerant, etc.

"The total evaporation and drift losses per ton of refrigeration for the conditions stated, are given in Table 1.

"Ordinarily it is considered that in atmospheric cooling about 1 gallon of water per 1,000 gallons of water circulated per degree of cooling range is lost by evaporation and 1 gallon of water per 100 gallons of water circulated is lost by drift.

"Thus for a plant in which the water enters the cooling tower at 88° F. and departs at 80° F. and which circulates 500 g.p.m., the loss will be $8 \times 500 \div 1{,}000 = 4$ g.p.m. by evaporation and $500 \div 100 = 5$ g.p.m. by drift, or a total of 9 g.p.m.

"If city water is to be used for condensing purposes, with the warmed water wasting to the sewer, the water consumption per ton of refrigeration will be:

"Mechanical compression refrigerating system—

$$\frac{250}{8.3 \times (95-76)} = 1.58 \text{ g.p.m. per ton}$$

"The saving in water consumption if a cooling tower should be used then will be:

$$\frac{100\ (1.58-0.0575)}{1.58} = 96.5\% \text{ for the compression system}$$

"A value of 90 to 95% generally is taken as the water conservation effected by the use of cooling tower equipment.

"The data in Table 2 represent approximate relations per ton of refrigeration for comparative purposes. Exact costs, of course, will depend on the size and specific conditions of the job.

"Assumptions made for these illustrations in addition to those in the foregoing examples, were: Freon-12 compression refrigerating system, all metal construction of cooling towers, 2.5 cents per kwh. electricity cost; 51 cents per 1,000 cu. ft. city water cost; 1,200 hours operation per season, interest and depreciation computed at 10% for owning cost.

"Independent analyses have shown that with present equipment costs and water costs for a load under 600 tons, the cost for the city water-using plant is slightly less than that using cooling tower equipment, and for loads above 600 tons there is a slight advantage to owning and operating cooling tower equipment.

"An increase in water rates, which might occur should a city filtration plant be installed, and a decrease in cost of cooling tower equipment after its wider usage and development, might easily change the economic balance."

Table 1—Evaporation and Drift Loss

Refrigerating System	Evaporative Loss, G.p.m. Per Ton	Drift Loss, G.p.m. Per Ton	Total Loss, G.p.m. Per Ton
Freon-12 Compression	0.0275	0.0300	0.0575
Steam Jet	0.0800	0.0885	0.1685

Table 2—Tabulation of Costs per Ton

Type of Water Cooling	First Cost In Dollars	Floor Space In Square Feet	Weight In Pounds	Owning and Operating Costs In Cents Per Hour
City Water	2	0	0	0.660
Forced Draft Cooling Tower	40	1	160	0.719
Evaporative Condenser	48	0.65	75	0.782

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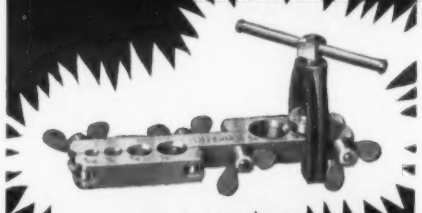

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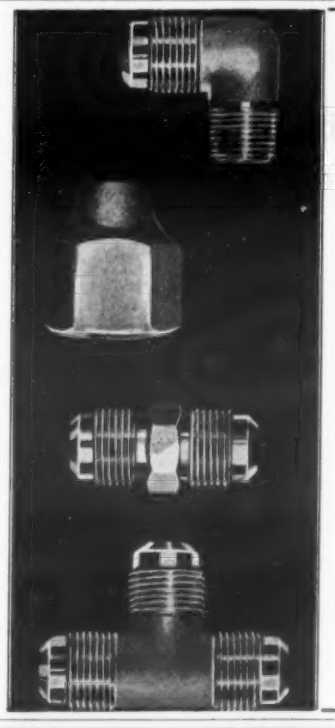

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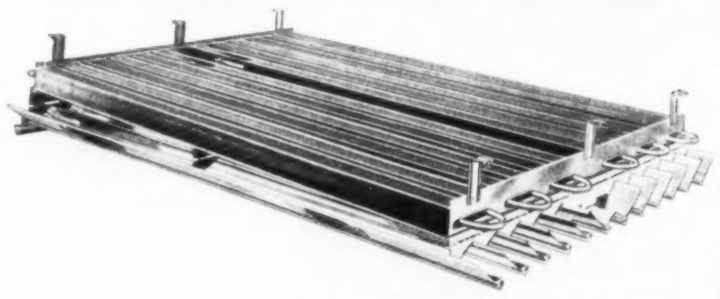

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Tests Indicate That Condensation Occurs Within Building Walls, But It Can Be Minimized

BY F. O. JORDAN

NEW YORK CITY—Clearing up much of the "mystery" about condensation within building walls, Prof. F. B. Rowley, head of the University of Minnesota engineering experiment station, presented a paper on that subject before the recent A.S.H.V.E. meeting here that is of considerable interest to both the building trade and the air-conditioning industry.

There has been some doubt in the minds of many engineers as to whether condensation actually takes place within the wall structure, and as to the extent of such condensation if it does occur.

At the same time there is the possibility of the serious effect of the presence of moisture in the wall toward deterioration of the cellular structure of any insulating material used in the wall, and toward reducing its insulating properties as well.

As a sales argument in favor of their products, the manufacturers of insulating materials which are non-hygroscopic (or which will not absorb moisture) commonly claim that condensation does occur in considerable quantities within walls, so that a hygroscopic insulation soon loses all insulating value because it shortly is reduced to a pulpy mass through absorption of the moisture which (they maintain) is condensed within it.

Furthermore, the statement often is made that the absorption of moisture by a hygroscopic insulating material results in such permanent deterioration of its cellular structure that it never regains its former insulating properties even if thoroughly dried out.

On the other side of this controversy is the school of thought which has maintained that condensation within walls does not occur, or occurs in such small quantities that any harmful effect from its presence is non-existant or negligible.

Obvious result of such persistant disagreement among the experts has been the complete bewilderment of the common people regarding the selection of a suitable insulation to incorporate in the structure of their homes, and as to the advisability of precautionary measures for preventing permeation of water vapor into insulated wall.

BECOMES IMPORTANT

Time was when the question of wall condensation was meaningless to the home-owner and to anyone interested in home building, simply because the use of insulation in building construction was practically unheard of, and because winter-time humidities in the interiors of buildings were reduced to the vanishing point by nature. Therefore, there was no moisture to gain access to the wall-space to condense there, and no insulation there to be injured if condensation had been possible.

But eventually winter air conditioning came into its own, and with it came higher room humidities and their beneficent effect upon health and comfort. And with the advent of automatic heat came house insulation, because of the greater need for economy of operation. Whereupon the picture has changed from one of the "good old days" of dry uninsulated homes, to the modern era of well insulated homes supplied with air at the much higher humidities required for healthful comfort.

But as always, with improvements come problems.

THE PROBLEM

Hence the modern question; does the difference in vapor pressure bebetween the humid conditioned interior and the dry out-of-doors upon a winter's day force moisture outwards through the insulated walls, and especially, does such moisture condense upon the insulating materials in sufficient quantity to produce harmful results?

In Prof. Rowley's paper is the definite answer "Yes." For the tests prove that the outside sheathing of the uninsulated wall can become so cold because the insulation so limits the flow to it of heat from the warm interior of the building, that condensation will take place upon it from the water vapor forced outward from the humid interior of the building.

Furthermore, it was demonstrated that the frost resulting from such condensation can extend back for some distance into the insulation itself, so that the insulation is in effect a mass of ice with little resistance to heat flow. Of course this result could be approximated whether or not the insulating material were hygroscopic.

TWO REMEDIES

Two remedial measures were found to be effective. One of these is to install a vapor-proof membrane at the warm side of the insulation (between the room and the insulation) which will prevent moisture from reaching it. This presents no difficulty, as any water-proof paper installed with sealed joints should suffice.

The other remedy is to provide vents at the cold side of the insulation which will allow the vapor to pass quickly outside. However, openings through the outside sheathing of a building would seem to be undesirable for several reasons.

While these tests prove that harmful condensation can take place in an insulated wall if desirable room humidities are maintained in cold weather and indicate desirable remedial measures, there are several important questions as yet unanswered. For example:

What is the approximate reduction in overall resistance to heat flow due to condensation of moisture in various types of walls and insulating materials under average field conditions?

How long is it required for the natural drying process to remove moisture condensed within the wall after the heating season is ended?

"The condensation of moisture takes place when water vapor is cooled below its saturation temperature," explained Prof. Rowley. "In the cases under consideration air is also present with the vapor, but the presence of air does not change the condensing temperatures of the vapor.

"This condensation of moisture may occur on the surface of a wall or at any place within the structure where the temperature of the material is below the saturation or dewpoint temperature of the vapor. If these temperatures are below the freezing point then the condensation will result in an accumulation of frost and ice.

MEASURING CONDENSATION

"The temperatures of the surfaces and interior parts of the wall may be calculated with reasonable accuracy from the known thermal properties of the materials used in the walls. The dewpoint temperature of the air to be carried within a room may be obtained from any psychrometric chart and thus the danger point of any interior wall surfaces may be anticipated.

"The dewpoint temperature of the air within the walls may also be determined from a psychrometric chart providing its conditions are known. Unfortunately the vapor-transmitting properties of building materials are not so well understood as the heat-transmitting properties are and the moisture conditions within a wall cannot be calculated so readily.

"The fundamental causes of condensation problems are high humidities and low temperatures of the materials with which the vapor comes in contact," declared the speaker. "Several of the changes which have recently taken place in air-conditioning requirements and building construction have greatly increased the probability of meeting these conditions.

NEW REQUIREMENTS

"These changes are: first, raising the relative humidity within the structure by artificial means, second, the application of weatherstrips and other means to prevent the filtration of air through the walls of the building, and third, the addition of better insulation in the walls of the building.

"These three factors are all necessary if the benefits of modern scientific developments are to be enjoyed and all have contributed to the moisture problem. It cannot be solved by placing the responsibility on any single factor."

For many years, said the speaker, the low relative humidity in the average residence and public building located in cold climates has been a subject of much discussion and the effect of these low humidities on both health and furnishings has been controversial. The net result has been an increase in the average relative humidities carried. Even though these higher relative humidities are often under control, they have contributed largely to the problem of condensation and frost formation within walls.

WEATHERSTRIPS USED

In recent years the loss of heat from a building due to the leakage of air around windows and doors has become more fully appreciated and various types of weatherstrips have been extensively used to reduce this exchange of air between the inside and outside of the building.

The absolute humidity of the outside air is usually much lower than that of the inside air and the natural result has been to build up the moisture content of the inside air by the normal processes within the building even though artificial humidification is not used.

"Increasing the relative humidity of the air in a building or adding weatherstrips to a building will increase the probability of condensation troubles, but the addition of insulation to the walls may either increase or decrease this probability, depending upon the type of construction and the part of the wall under consideration," declared Prof. Rowley.

WORSE ON OUTSIDE

"Since insulation resists the passage of heat, that portion of the wall on the warm side of the insulation will become warmer and that portion on the cold side will become colder after the insulation is applied.

"If the inside wall surfaces are being considered the conditions are improved. If, however, consideration is being given to that portion of the wall on the cold side of the insulation, conditions may be aggravated due to the lower temperatures, especially if the moisture can penetrate to this part of the wall."

Prof. Rowley explained that "it is usually not difficult to estimate reasonable inside air temperatures and humidities which are to be carried in the building, but if these requirements are not adhered to in practice they may be directly responsible for condensation difficulties. Since outside weather conditions cannot be controlled, an intelligent study of Weather Bureau records should be made to find what extreme conditions may be expected for any particular location.

"The thermal conductivities of most materials are sufficiently well understood to make calculations for the wall temperatures to be expected under maximum conditions.

(Concluded on Page 21, Column 1)

Table 1—Relative Condensation for Different Types of Wall Construction

Type of Wall and Insulation	Special Vapor Barrier	Wall No.	Cold Room Temp. ° F.	Surface Temp. of Sheathing ° F.	Condensate Grams Per Sq. Ft. Per 24 Hours
Standard, No insulation	None	2	—7.7	28.5	0.46
Standard with 3⅝ in. rock wool	None	6	—7.7	10.2	2.34
	None	19	—7.7	9.6	2.71
Standard with 3⅝ in. rock wool	50 lb bldg. paper,* lapped joints	17	—7.7	8.1	0.46
		18	—7.7	9.3	0.56
Standard with 3⅝ in. rock wool	A* lapped joints	9	—7.7	7.6	0.21
		10	—7.7	9.2	0.19
Standard with 3⅝ in. rock wool	B* lapped joints	11	—7.7	5.8	0.0
		12	—7.7	9.1	0.06
Standard with 3⅝ in. rock wool	A* sealed joints	13	—7.7	7.5	0.11
		14	—7.7	9.5	0.12
Standard with 3⅝ in. rock wool	B* sealed joints	15	—7.7	8.4	0.0
		16	—7.7	8.4	0.0
Standard with 3⅝ in. rock wool	2 coats flat white paint	1-A	—7.7	9.7	0.31
Standard with 3⅝ in. rock wool	2 coats aluminum paint	3-A	—7.7	10.6	0.23
Standard with 3⅝ in. rock wool	1 coat size, 2 coats flat white paint	4-A	—7.7	10.7	0.33
Standard with 3⅝ in. rock wool	2 coats size	7-A	—7.7	11.8	0.22
Standard with 3⅝ in. rock wool	1 coat size, 2 coats aluminum paint	8-A	—7.7	13.4	0.22
Standard with 3⅝ in. rock wool	1 coat asphalt paint	24	—7.7	11.1	0.15
Standard with 3⅝ in. rock wool	2-in. hole in sheathing only	21	—7.7	10.7	3.08
No building paper between sheathing and siding 3⅝ in. rock wool	None	20	—7.7	9.6	3.06
Standard with 3⅝ in. rock wool	4 1-in. vent holes in each stud section	5A	—7.7	4.3	0.0

*All vapor barriers placed between metal lath and studs.
A—30, 30, 30 duplex paper, 2 sheets 30-lb. paper cemented together with 30-lb. asphalt.
B—Asphalt impregnated and surface coated sheathing paper, glossy surfaced and weighing 50 lbs. per roll of 500 sq. ft.

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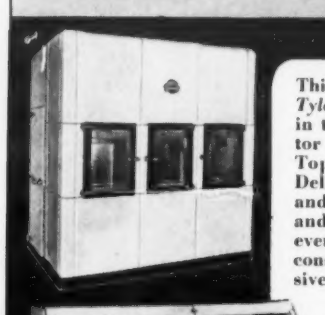

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High Vapor Resistant Materials in Inner Section, & Low Vapor Resistant Materials In Outer Section, Reduce Condensation

(*Concluded from Page 20, Column 5*)

"The vapor transmitting properties of various materials under different conditions have not as yet been well defined and this presents one of the most difficult steps in designing a structure which will be free from condensation troubles. It is easy to determine the dewpoint temperature of the air which is to be maintained within a building and to calculate the minimum outside weather conditions which may be met without lowering the inside surface temperature below the dewpoint temperature of the air, but it is not easy to calculate the dewpoint temperature which may be expected for the vapor in the interior parts of the wall.

"Vapor travels from a point of high vapor pressure to a point of lower vapor pressure, which in the case of ordinary walls in cold climates is from the inside surface to the outside surface of the wall. If the inner surface has a low resistance to the passage of vapor and the outer surface has a high resistance, then in extreme cases the interior part of the wall may have vapor pressures equal to the air inside of the building.

"If, on the other hand, the inside surface has a high vapor resistance and the outside a low vapor resistance, then the vapor in the interior parts of the wall may have a dewpoint temperature more nearly equal to that of the outside air.

STOP ON WARMER SIDE

"Since condensation of moisture can only take place when the wall temperatures are below the dewpoint temperature of the vapors present, the logical solution is to select materials for the inside sections of a wall which have a high vapor resistance, and for the outside sections materials which have a low vapor resistance. Insofar as possible the vapor should be stopped on the high temperature side of the wall and not on the low temperature side.

"In most cases the vapor density within any section of a wall will be governed by the difference in vapor pressure on the two sides of the wall and the vapor resistance of the materials on each side of the section under consideration.

"By the proper selection and application of materials in a wall the rate of vapor travel through the various parts of the wall may be controlled, and therefore the vapor pressure within the wall may be regulated and maintained at a safe level for any temperature conditions which may be expected within the wall.

TESTS EMPLOYED

"Recognizing that there are condensation problems with many types of building construction in combination with various air temperatures and relative humidities as found in modern types of construction," said the speaker, "an extensive research program has been initiated to investigate the several factors. The aim is first, to determine the extent of the condensation problem under normal and extreme conditions; second, to obtain a measure of the relative value of the various methods of correcting these difficulties; and third, to find the limiting conditions under which various types of building construction may be used without excessive condensation troubles and still retain the benefits of higher humidities and good building construction.

"To accomplish this a test room was constructed 30 ft. square and 25 ft. high in which it was possible to control the air temperatures to a minimum of 30° F. below zero. Small size test houses were constructed and placed within this room with provisions for maintaining the air temperature and humidities within the houses at any desired level.

"The houses were so constructed that they might be taken apart and examined from time to time throughout a test period to determine the physical conditions of the interior of the walls and to make comparisons between various types of structures.

"The test houses were all of frame construction and 4 ft. x 4 ft. x 4 ft. inside dimensions. The main frame for supporting the walls and ceiling of each house was built up with 4 in. x 4 in. corner posts attached rigidly to the four corners of the floor and connected at the top with a 4 in. x 4 in. frame.

"The walls were constructed of 2 in. x 4 in. studs spaced 16 in. on center with a 2 in. x 4 in. plate at top and bottom. In all cases the interior finish was made up of metal lath and three coats of plaster; a scratch, brown, and finish coat, making a total of ¾ in. in thickness.

"Outside sections of the walls were constructed with $^{25}/_{32}$ in. pine sheathing, building paper, and 6 in. redwood siding. For walls Nos. 1 to 16 inclusive, 6 in. pine butt sheathing was used, and for all other walls 8 in. pine shiplap was used.

OUTSIDE CONSTRUCTION

"The outside construction was nailed to 1 in. square nailing strips which were fitted into corresponding grooves in the outside surface of the studs. The assembled outside unit was securely applied to the studs using wood screws instead of nails so that it could be removed for inspection at various periods of the test. The assembled wall was provided on the outside with a 2 in. x 2 in. x ⅛ in. angle iron frame. When the assembled wall was applied to the test house the angle iron frame was securely fastened and sealed to the 4 in. x 4 in. framework.

"Ceilings were constructed with 2 in. x 4 in. joists spaced 16 in. on center with metal lath and 3 coats of plaster on the inner surface, and with building paper and 6 in. pine butt sheathing on the outer surface. The outer surface finish was nailed to 1 in. square nailing strips and fastened to the studs with wood screws in the same manner as for the side wall construction.

"A 2 in. x 2 in. x ⅛ in. angle iron frame was applied around the outside of the finished ceiling. The floors of the test unit were built with 2 in. x 4 in. joists spaced 16 in. on center with building paper on top and bottom and covered on the lower side with 6 in. butt sheathing, and on the upper side with rough flooring and a finished fir floor. The floors were made integral with the 4 in. x 4 in. framework and not removed or opened for inspection during the test.

MATERIALS USED

"The first and second coats of plaster were made of beaver fibered plaster and the finished coat was ivory hydrated finishing lime. In all cases the plaster was allowed to dry at least 14 days before making tests. The paint used for the outside surface of the walls was made up of 70% pigment and 30% vehicle by weight. The pigment was a pure white lead paste and the vehicle was 90% linseed oil and 10% dryer.

"Some of the walls were insulated and some were not. Vapor proof barriers were added to the inside surface of part of the walls in the form of a surface paint or in the form of a vapor proof paper placed between the metal lath and studs. The outside sections of some of the walls were changed by omitting the building paper and by drilling ventilating holes through the sheathing."

Prof. Rowley explained the test procedure employed as follows:

"In making a test the test houses were completely assembled, the cooling equipment started, and the room temperature brought down to test requirements. Test conditions were then maintained for a reasonable time to establish uniform temperature and humidity gradients through the walls.

"After this preliminary period the walls were inspected to determine their condition without allowing any unnecessary changes in temperature or moisture conditions surrounding them.

VARIETY OF TESTS

"After these records were made the walls were again closed and the test continued for a period of from 5 to 19 days, after which the walls were again taken apart and inspected to get the rate of frost formation or other changes under constant temperature and humidity conditions. At the end of the test the walls were completely taken apart and all observations made including photographs of typical conditions."

In summing up the test results the speaker declared:

GENERAL RESULTS

"There is no doubt but that the condensation of moisture in walls is a troublesome problem with many types of construction under adverse conditions, and that in the past many difficult situations have arisen due to a lack of understanding of the true nature of the problem and to the fact that different building materials have been combined without regard to the effect of these combinations on the thermal and vapor properties of a wall.

"Since the temperatures of the various parts of a wall are controlled by the type and amount of insulation used and the vapor densities in the corresponding parts are controlled by the vapor barriers used, the transmission of heat and vapor through a wall must be considered together, and in most cases an intelligent combination of insulation and vapor barriers will eliminate any chance of trouble. A fundamental principle often overlooked is that a vapor barrier should be placed on the warm side and not on the cold side of a wall.

RECOMMENDATIONS

"While there is still much research work to be done concerning practical vapor barriers and the limiting conditions under which they may be used, the results obtained thus far prove the practicability of solving the problem by applying high vapor resistant materials to the inner section and low vapor resistant materials to the outer section of the wall.

"The problem is not to be feared after it is once understood. It is the intention to continue the investigation not only to study the individual vapor barriers and their limiting conditions but also to consider all of the problems involved in practical house construction by the use of large scale test 'houses within the cold room."

In Tables 1 and 2 are listed comparative figures for the various types of construction employed. The comparative data show clearly the importance of providing an effective seal on the warm side of the insulating material.

Table 2—Relative Condensation for Different Types of Ceiling Construction

Type of Ceiling and Insulation	Special Vapor Barrier	Ceiling No.	Cold Room ° F.	Surface Temp. of Sheathing ° F.	Condensate Grams Per Sq. Ft. Per 24 Hours
Standard with ⅜ in. rock wool	None	C-2	—7.7	6.9	2.68
Standard with ⅜ in. expanded aluminum magnesium silicate	None	C-1-A	—7.7	9.2	2.45
Standard with ⅜ in. redwood bark fiber	None	C-5	—7.7	7.4	2.96
Standard with ⅜ in. sawdust	None	C-6	—7.7	9.6	2.45
Standard with ⅜ in. rock wool	B* lapped joints	C-3	—7.7	4.2	0.02
Standard with ⅜ in. rock wool	B* sealed joints	C-4	—7.7	6.8	0.15

*All vapor barriers placed between metal lath and studs.
B—Asphalt impregnated and surface coated sheathing paper, glossy surfaced and weighing 50 lbs. per roll of 500 sq. ft.

Hayes Named Sales Manager Of Fox Furnace Co.

ELYRIA, Ohio—Edward P. Hayes has been appointed general sales manager of Fox Furnace Co. to succeed George Boeddener, according to an announcement by C. A. Olsen, president.

Three Dallas Department Stores Were Equipped Last Year

DALLAS—Three leading department stores in Dallas, one of the most completely air-conditioned cities in the United States, installed air-cooling systems during 1937 to meet "hot weather" competition.

All of the stores report an increase in employe comfort and efficiency, as well as increased business and a reduction in spoilage, according to Carrier engineers who supervised the installations. Due to the cleanliness factor, a reduction in decorating costs has also been reported.

Most elaborate of these systems is in Dreyfuss & Sons building. In this installation all outlet grilles blend with the modern fixtures used in the store.

The Dreyfuss installation employs a Carrier centrifugal refrigeration machine and nine Carrier "Weathermakers," located at advantageous points on five floors of the building. Air-conditioned departments include haberdashery, shoes, men's and women's clothing, ladies ready-to-wear, and the executive offices. Conditioning units are suspended in unobtrusive spots to save floor space. All ductwork is furred in, behind walls and ceilings, or concealed behind curtains and modern fixtures. Air is distributed by the Carrier ejector system, which controls the force of air circulation, and is controlled to maintain a temperature differential in keeping with the outside thermometer reading.

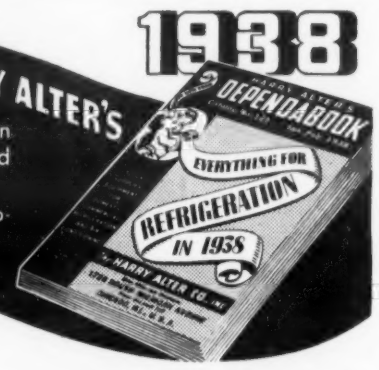
The Neiman-Marcus store included an air-conditioning system as part of an extensive remodeling of the store's third floor. Three Carrier units were suspended from the ceiling to conserve floor space; these units serving the younger set shop, lingerie and millinery departments.

All sales space and the fur alteration room of the La Mode store were also air conditioned by Carrier Corp. during 1937. Equipment was installed in a platform on the roof of the building, a "spider-web" duct system carrying the conditioned air to the store..

Krib and Landauer, Dallas, acted as consulting engineers in the design and installation of all three systems.

THE BUYER'S GUIDE

Send today for HARRY ALTER'S 1938 DEPENDABOOK
The latest and finest in refrigeration and air conditioning parts, tools and equipment.
• Our large stocks permit prompt shipment at lowest prices.
THE HARRY ALTER CO.
1728 So. Michigan Ave., Chicago, Ill.
Branches: New York, Cleveland, St. Louis



Model No. 500-A

"CHIEFTAIN"
QUALITY-BUILT COMPRESSORS and CONDENSING UNITS
All bearings diamond bored. Positive lubrication of parts by newly developed process plus forced feed lubrication in all models.
Sizes ⅙, ⅛, ¼, ⅓, ½, ¾ H.P.
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Get a Gilmer V-Belt... Gilmers FIT
Gilmer gives you more accurate fits—better service. No more trouble now to get the right belts fast for special jobs. Gilmer V-Belts are made on the world's largest assortment of V-moulds. Prompt deliveries everywhere, always.
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REFRIGERATION ACME PRODUCTS AIR CONDITIONING
"It's better to use ACME PRODUCTS than to try to compete against them."
ACME INDUSTRIES, INC.
JACKSON MICHIGAN

Michigan Farmers Hear of New Way to Use Electricity 'Down on the Farm'

EAST LANSING, Mich.—"Michigan farmers will soon be doing things the cheap way, the easy way, the electrical way," declared Prof. D. G. Ebinger of Michigan State College, speaking before the last general session of the Farmers Week program here.

Among the many electrical devices cited by the rural electrification specialist was an electric milk cooler, a greenhouse sprayer, a small corn grinder, and a feed mixer.

A recent invention that will prove a great aid to dairymen is a portable water heater and sterilizer, which will sterilize a milk can in approximately four minutes.

Other developments cited by Prof. Ebinger included electric brooders, a rotary fan circulating warm air in hen houses, and an electrically heated waxer for removing pin feathers. Another device grades and candles eggs in one operation.

One of the most startling developments described by Prof. Ebinger was the new Sperti lamp which, it is said, emits "invisible rays" having the property of preserving meats and other perishables indefinitely. Exposure to the rays is only necessary three or four times a day, Prof. Ebinger said.

The device may have a great influence on the air-conditioning industry, as the rays are said to have a remarkable influence in preventing winter colds.

Another use of the rays from the Sperti lamp is to produce illumination in closed rooms permitting matching of colors which now must be done in daylight, Prof. Ebinger said.

Still another development outlined by Prof. Ebinger was a new electric storage battery which will provide current for a year on a single charging and may be re-charged 10 times. Price of the new battery is said to be under $20.

The talk by Prof. Ebinger followed a message read by Robert S. Shaw, president of Michigan State College, in which Gov. Frank Murphy outlined his intention of promoting "all the comforts and conveniences enjoyed by the cities," in the rural districts.

The governor's message pointed out that state and federal activities had stimulated rural electrification to the extent of 25,000 new customers for private power companies in recent years, and that the proportion of electrified Michigan farms had risen from 22 to 24%, advancing the state from eighteenth to fourteenth place in percentage of farms served, and placing the state fifth in number of rural homes having electrification.

Interstate Electric Leases Shreveport Building

SHREVEPORT, La. — Interstate Electric Co., distributor in this territory for Crosley Shelvador refrigerators and other electrical appliances, has obtained a 10-year lease on a building at 200 Crockett St. here.

The distributing company will use this new property for office and display room space after spending some $28,000 in remodeling the building under a building permit recently granted to cover repairs and renovation.

NEW IDEAS FOR REFRIGERATOR DOORS

1. Locked-in, lift-out doors
2. Tightly closed overlap
3. Reduced air leakage
4. Roller bearings
5. Quiet closure
6. Lighter weight
7. Greater strength
8. Shock absorbing jambs

AT no extra cost — all the engineering features for display cabinet doors listed at right — with the new Ace "Loxit" hard rubber assembly units — doors, rails, jambs. Complete range of sizes — American Hard Rubber Co., 11 Mercer St., New York . . . 111 West Washington St., Chicago, Ill. . . . Akron, Ohio.

ACE "LOXIT" (Pat'd) DOORS

HENRY "Y" Strainer FOR COPPER PIPE

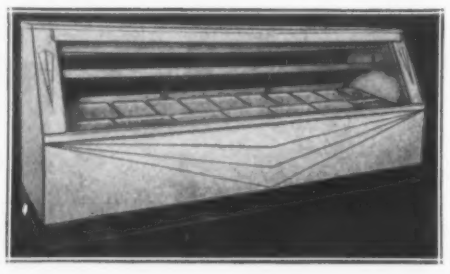
Exceptional design. Made of brass. Negligible pressure drop. Easily removable screen. Very large screen area. Light weight. Trapping of oil can be entirely prevented by installing strainer on its side or in a vertical position. Write for Catalog 62: Dryers, Strainers, Valves and Service Tools.

Type 895

HENRY VALVE CO. 1001 19 N. SPAULDING AVE. CHICAGO, ILL.

Stocked By Leading Jobbers

ANNOUNCING OUR NEW 1938 LINE OF COMPLETE FOOD MARKET EQUIPMENT:



Display Cases, Walk-in Coolers, Vegetable Display Cases, Reach-in Boxes for Restaurants, Hotels, and Bakers.

- Streamlined Beauty
- World's Highest Quality
- Genuine Porcelain Interior and Exterior—(No Imitation Finishes Used)
- Assured Lifetime Vision
- Competitively Priced
- Liberal Dealer's Discount
- Financing Plan for Dealers
- Over 40 Years of Experience

WRITE IMMEDIATELY FOR FULL DETAILS

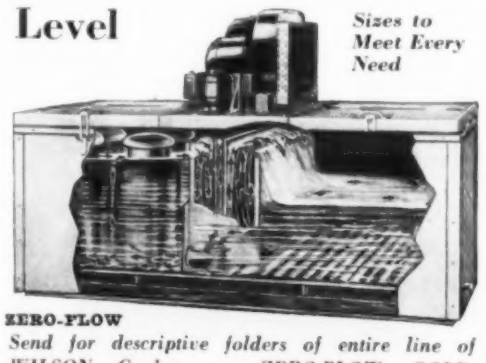
FOGEL REFRIGERATOR CO.
16th & Vine Sts., Philadelphia, Pa.

Constant, Neck-High Water Level
During Entire Cooling Period

ZERO-FLOW automatically keeps icy-cold water vigorously circulating around the cans . . . at neck-high level . . . for both night's and morning's milk . . . regardless of number of cans immersed.

Because of the constant flow of water directly through central cooling compartment, milk is cooled faster (95° to 50° in less than an hour) . . . and at a saving of compressor running time. Speed and economy . . . plus the finest cabinet and the most efficiently designed cooling system made . . . give ZERO-FLOW a combination of selling points that appeals instantly to every dairy farmer.

Sizes to Meet Every Need



ZERO-FLOW

Send for descriptive folders of entire line of WILSON Coolers . . . ZERO-FLOW, COLD-WHIRL, VERTI-COIL, WALK-IN, "Dry Storage."

Good Territories Still Available . . . Write for Dealer Proposition

WILSON CABINET CORP., *Smyrna, Del.*

QUESTIONS

Address of Manufacturer

No. 3154 (Parts Jobber, California)—"We are wondering if you can supply us with the address of the Holsclaw Mfg. Co.? These people manufacture a bender for copper tubing, and as we desire to show this in our new refrigeration catalog, we would like to get in touch with them promptly. Therefore, if you can give us the information required by return air mail, it will be very much appreciated."

Answer: Address of the Holsclaw Bros., Inc., is 317 Goodsell Ave., Evansville, Ind. For complete lists of all manufacturers of refrigeration and air-conditioning equipment, parts, and supplies, you can refer to the 1938 Refrigeration and Air Conditioning Directory, published by Business News Publishing Co., 5229 Cass Ave., Detroit, Mich., publisher of AIR CONDITIONING & REFRIGERATION NEWS. This 252-page Directory is now available at the cost of $1.00 per copy.

Small Milk Aerator

No. 3155 (Manufacturer, Michigan)—"Please advise where we may purchase a small milk aerator, ranging from 30 to 50 gallons per hour capacity."

Answer: The following companies manufacture dairy aerators:

Cherry-Burrell Corp.
427 W. Randolph St., Chicago, Ill.

Creamery Package Mfg. Co.
1243 W. Washington Blvd., Chicago, Ill.

Esco Cabinet Co.
140 E. Market, West Chester, Pa.

Kaestner Co., E. A.
516 N. Calvert St., Baltimore, Md.

Ward Co., H. H.
Fourth & Engle Sts., Chester, Pa.

Makers of Kerosene Units

No. 3156 (Exporter, New York)—"We would appreciate your mailing to us the names of all the manufacturers of kerosene or gasoline type of household refrigerators. Any additional information that you could possibly give us concerning this field will be greatly appreciated."

Answer: Following are manufacturers of kerosene-operated refrigerators:

Crosley Radio Corp., Cincinnati, Ohio

Electrolux Refrigerator Sales Div.
Servel, Inc., Evansville, Ind.

General Household Utilities Co.
2638 N. Crawford Ave., Chicago, Ill.

Perfection Stove Co.
7609 Platt Ave., Cleveland, Ohio

Allen Wrenches

No. 3157 (Parts Jobber, Georgia)—"We would appreciate it if you would advise us the name and address of the manufacturer who makes Allen set screw wrenches."

Answer: We believe that the Billings & Spencer Co., Hartford, Conn., is the manufacturer of Allen set screw wrenches.

Waukesha Units

No. 3158 (Dealer, Colorado)—"Please quote me your REFRIGERATION NEWS with your Master Service Manual.

"I would also like a little advertising literature on Waukesha gasoline-operated refrigeration if they are still manufactured. I am not certain of the address of the Waukesha people."

Answer: Waukesha Motor Co. is located at Waukesha, Wis.

They Want Information On Federal's 'Blue Book'

No. 3159 (Distributor, New York)—"In the Jan. 19 issue of your publication, an article appears on a trade-in 'Blue Book' published by the Federal Refrigerator Corp. Can you send us the address of this concern?"

Answer: See below.

No. 3160 (Dealer, Michigan)—"In the Jan. 19 issue of the NEWS a news item refers to a 'blue book,' listing valuations of used refrigeration equipment, which has been prepared by the Federal Refrigeration Corp.

"Would you please advise us what the price is and how we can obtain one of these books?"

Answer: See below.

No. 3161 (Dealer, Texas)—"Please send me information and price on the trade-in blue book issued by the Federal Refrigerator Corp. mentioned in your Jan. 19, 1937 AIR CONDITIONING & REFRIGERATION NEWS issue. If you do not have this information available can you tell me where I can get it?"

Answer: The address of the Federal Refrigerator Corp. is 57 East 25th St., New York City.

Potter Refrigerators

No. 3162 (Dealer, New York)—"I would appreciate it very much if you would forward to me in the enclosed envelope the address of the makers of a refrigerator manufactured by Potter."

Answer: Address Potter Refrigerator Corp., 220 Delaware Ave., Buffalo, N. Y.

Lists of Manufacturers

No. 3163 (Reader, Connecticut)—"Would you kindly send me a list of the manufacturers in the air-conditioning field.

"I would appreciate this very much and to return the favor I will subscribe to AIR CONDITIONING & REFRIGERATION NEWS."

Answer: See below.

No. 3164 (Distributor, New Jersey)—"We are jobbers of refrigeration materials. We are interested in room coolers.

"We would like to have you send us a list of manufacturers who sell any kind of a refrigerant or electrical cabinet (floor model) room coolers.

"Any information pertaining to this subject will be appreciated."

Answer: For complete lists of all manufacturers of refrigeration and air-conditioning equipment, parts, and supplies, you can refer to the 1938 Refrigeration & Air Conditioning Directory, published by Business News Publishing Co., 5229 Cass Ave., Detroit, Mich., publisher of AIR CONDITIONING & REFRIGERATION NEWS. This 252-page Directory is now available at the cost of $1.00 per copy.

The arrangement, classification of products, and the selection of names in this Directory has been made entirely from the viewpoint of the average buyer in the refrigeration and air-conditioning business. The book is an entirely new compilation from start to finish. The products are classified under natural groupings, and there is a complete index of all classified products in the back of the book.

Next Refrigeration Show Probably This Fall

No. 3165 (Manufacturer, Michigan)—"Please let us know when the Refrigeration Engineers show will be held at Chicago.

"What will display rates be?"

Answer: The Refrigeration Engineers' show was held in Chicago in November and there will not be another until next fall, date of which, we do not believe, has been set as yet.

Refrigeration Standards And Wiring Books

No. 3166 (Service Man, Quebec, Canada)—"I'm a reader of the NEWS since many years. In the following back numbers March 24, 1937 and May 19, 1937, I have found the two following addresses concerning book publishers.

"March 24, 1937 issue, page 17: the article being entitled as follows: Electrical Association Sponsor Handbook of Interior Wiring. It is said that the book is being issued by the Edison Electric Institute.

"May 19, 1937 issue, page 24: the article being entitled as follows: Refrigerant Pipe Size Table. It is said that the book "Certified Refrigeration Standards and Engineering Data" is published by the Chicago Master Steam Fitters' Association.

"Will you kindly send me more complete addresses regarding publishers."

Answer: The address of the Edison Electric Institute is 420 Lexington Ave., New York City; and of the Chicago Master Steam Fitters' Association is 228 North La Salle St., Chicago, Ill.

Uniflow Coolers

No. 3167 (Distributor, Louisiana)—"Please advise us the name and address of manufacturers of 'Uniflow water coolers,' or if you prefer, you may write them direct requesting that they send us literature, together with wholesale distributor cost, and suggested resale *dealer* cost."

Answer: Uniflow water coolers are manufactured by the Uniflow Mfg. Co., Erie, Pa.

Dayton Pulleys

No. 3168 (Parts Jobber, Pennsylvania)—"Can you furnish us with the address of the Dayton Pulley Co. or the Dayton Fan Co., a concern which manufactures motor pulleys whose advertisement we have seen in your magazine? However, they have not advertised in the last four issues.

"We have written to them at Dayton, Ohio, and their letters have been returned marked, 'No such concern.'"

Answer: We suggest that you try the Dayton Rubber Mfg. Co., West Riverview Ave., Dayton, Ohio, and the International Engineering, Inc., 1145 Bolander Ave., Dayton, Ohio.

Gasket Stapler

No. 3169 (Parts Jobber, Pennsylvania)—"Can you furnish us with the address of the company that manufactures a stapling machine for stapling gaskets on refrigerator doors? The trade name of this instrument is Kling Tite Automatic Stapler."

Answer: Try the United States Indestructible Gasket Co., 827 E. 15th St., Brooklyn, N. Y.

Vapor Heads

No. 3170 (Manufacturer, Ontario, Canada)—"We are taking the liberty of writing you to find out, if you can advise us where to purchase vapor heads. We have written several places, but are unable to locate the product required.

"The vapor head we want is used when displaying vegetables, the head vaporizes water and throws a vapor over the vegetables on display."

Answer: For a source of supply for vapor heads write to the Hickmann Specialty Co., Hamburg, N. Y.

New Room Cooler Makers

No. 3171 (Dealer, Missouri)—"I note with interest in your news columns that you mention room coolers as manufactured by Johnson & Indian Products Corp.

"Will you be so good as to give me the address of these two concerns."

Answer: Address the refrigeration division of the Johnson Motor Co., Galesburg, Ill., and the Indian Kool Room division of the Indian Trailer Corp., 2388 South Indiana Ave., Chicago, Ill.

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

HAVING COMPLETED seven years as an employer, I honestly believe I can now be a valuable employee. Seven years as commercial refrigeration salesman and manufacturer's representative with large firm; also seven years in my own business selling, servicing, installing refrigeration and air conditioning. Best of references. Thirty-eight years old, five feet eleven inches tall, weigh one hundred ninety pounds, not in debt, happy and ready for work. Box 1018, Air Conditioning & Refrigeration News.

FRANCHISES AVAILABLE

COMPLETE LINE of refrigerator display cases, walk-in coolers, and refrigerators for meat markets, grocers, restaurants, etc. Sell with Ehrlich line of compressors, or with any other line of machines. Attractive discounts, also liberal financing arrangements to help sell. 69 years in business. Write for full information and catalog. H. EHRLICH & SONS MFG. CO., Refrigerator Builders, St. Joseph, Mo.

REPAIR SERVICE

DOMESTIC CONTROLS repaired. Ranco pencil types $1.75. General Electric, Cutler-Hammer, Tag, Penn, Ranco box types $2.00. Bishop Babcock, Majestic, Penn magnetic types $2.50. Mayson and Detroit valves $1.15. Thermostatic expansion valves $3.50. All calibrated to factory specifications. UNITED SPEEDOMETER REPAIR COMPANY, 436 West 57th Street, New York City.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

Jobber Activities

Chicago Association Elects New Officers

CHICAGO—Members of Chicago Refrigeration Suppliers, local jobbers' association, met at the close of the organization's first fiscal year to elect the following officers for the current season:

H. W. Blythe, H. W. Blythe Co., president and director; W. F. Hauber, Automatic Heating & Cooling Supply Co., vice president and director; Mrs. D. E. Browne, B-Line Refrigeration Parts Co., secretary; E. B. Chase, Chase Refrigeration Supply Co., treasurer; Irving Alter, Harry Alter Co., director. Herbert Binner remains executive secretary.

The association also announced that during its first year of operation it had attained many of the objectives outlined in its original program, and the 10 member companies voted to send a letter of thanks to manufacturers who had cooperated with the organization.

Debes & Co. Moves Its West Side Store

CLEVELAND—Debes & Co., jobber of refrigeration equipment and supplies, has moved its west side branch store to a new location at 2607 Detroit Ave., just a few doors down from its former location at 2529 Detroit Ave., reports Karl L. Debes, owner.

Main store and business office of Debes & Co. is located at 1249 East 105th St. A complete stock of parts is carried at both locations, Mr. Debes says.

Law & Co. Acquires Number of Lines

ELMIRA, N. Y.—Law & Co., refrigeration supply jobber, now handles products of the following manufacturers: Ansul Chemical Co.; United Wire & Tube; Weatherhead Co.; Gates Rubber Co.; Ranco, Inc.; Zenith Carburetor Co.; Imperial Brass Mfg. Co.; Perfection Refrigeration Parts; Jarrow Products Corp.; Jas. P. Marsh & Co.; and Peerless of America, Inc.

Kilfrost Introduces Paste To Stop Ice Formation

LONDON, England—Kilfrost Mfg. Co., Ltd., is producing Kilfrost paste which, when applied to refrigerant pipes in cold storage rooms, is said to prevent the frost and snow which forms on the pipes from changing into ice, thus ensuring easy defrosting. It may also be used to prevent ice formation on the wings of airplanes.

By eliminating the insulating effect of an ice coating on the pipes, the paste also is said to increase the efficiency of the cooling elements.

The paste is applied to the bare pipes with a brush. When a coating of frost forms on the outside, it may easily be tapped or pulled off, leaving the pipes clean and ready for another coating of paste.

Once the pipes have been treated correctly, the defrosting period is extended to 18 months and longer.

In chambers with temperatures higher than 30° F., ice eventually forms on top of the Kilfrost coat, but it is said that this may be tapped off easily.

For all chambers held at above 30° F. 1 lb. of Kilfrost is required for every 75 feet run of nominal 2-inch o.d. piping, or for every 60 feet of 2½-inch o.d. piping.

For all chambers held at below 30° F., 1 lb. is required for every 50 feet of 2-inch o.d. piping, or for every 40 feet of 2½-inch o.d. piping.

Adam Matheson, Head of Refrigerant Firm, Dies

EAST RUTHERFORD, N. J.—Adam M. Matheson, president, The Matheson Co., distributor of refrigerants and refrigerator oils, died Jan. 25.

Republic Electric Co. Plans Big Meeting On Feb. 25

DAVENPORT, Iowa — Republic Electric Co., refrigeration supply jobber serving eastern Iowa and western Illinois, has invited refrigeration engineers, dealers, and service men in its territory to attend a meeting which will begin at 10 a.m., Feb. 25, in the Blackhawk hotel.

Refrigeration supplies will be displayed and engineers and manufacturers will speak on their 1938 lines of equipment. A crowd of 150 to 200 dealers and service engineers is expected.

Each person attending the meeting will be a guest of Republic Electric Co. for luncheon and dinner.

St. Louis Branch of Alter Co. Moves

ST. LOUIS—Local branch of the Harry Alter Co., refrigeration supplies jobber, has been moved to a new location at 2910 Washington Ave., on the city's main east-west thoroughfare.

New quarters contain 5,000 sq. ft. of floor area, and permit carrying of a stock large enough to handle all requirements of customers in St. Louis and the surrounding territory, it is said. Building is of one-story construction, with modern shipping facilities.

Stock was moved into the new location over a week-end, after business hours, so that the branch's service could be carried on without interruption. The St. Louis branch is headed by B. F. Anthony.

New Catalog Issued By Grainger

CHICAGO—W. W. Grainger, Inc., refrigeration supply jobber, has issued a new catalog, known as No. 96, describing the various lines of products which it handles.

J. F. Coyne Joins Staff Of H. Channon Co.

CHICAGO—J. F. Coyne has joined the refrigeration, air-conditioning, and heating department of H. Channon Co., parts and supplies jobber.

Detroit Exposition Will Show Electrical Wiring

DETROIT—The annual Electrical Manufacturers Industrial Exhibition will be held Feb. 16, 17, and 18 in the drill hall of the Masonic Temple here, according to A. S. McCloy, chairman of the exhibition's publicity committee.

The display will be devoted exclusively to wiring and insulation materials and all types of electrical equipment for buildings or industrial plants. No appliances of any kind will be shown. Contracts already have been signed for 100 booths.

The exhibition will be open free of charge to any adult interested in this type of equipment, but special invitations have been sent to architects, electricians, electrical engineers and inspectors, and trade school students and faculties.

Goodrich Develops New Vibro-Insulators

AKRON, Ohio—A new type of vibro-insulator has been announced as an addition to its line of rubber-to-metal type mountings by The B. F. Goodrich Co.

Made of a rubber compound with low permanent set, the new vibro-insulator is designed to carry loads either in shear or compression, respective capacities being 30 and 120 lbs.

Listed as Type 30 Vibro-Insulator, the new product is particularly useful in compression as a mounting for refrigerating units and air compressors.

Detroit Jurist Sees Higher Down Payment As Cure for Many Instalment Selling Evils

(Concluded from Page 1, Column 5)

can be reasonably sure, barring unforeseen happenings, that the appliance or other article purchased will be paid out. But when a customer can't even scrape up enough cash to make a down payment, by what sleight-of-hand can he be expected to dig up the wherewithal for the monthly instalments? Judge Gillis asks.

Over-competition between dealers and over-anxiety to land the order, regardless of the prospective buyer's past credit record, combined with high-pressure selling on the "no down payment" plan—these are malpractices which must be brought under control if the real advantages of instalment selling, in promoting better living standards for more people, are to be fully realized, Judge Gillis believes.

"Dishonest collateral" is at the bottom of much of the trouble, he points out. Over-pricing of the article, and its sale on careless credit terms, results in an abnormal number of defaults on payments. Had the article been priced right and sold on a substantial down payment, the store or finance company would be able to "come out" on the deal (except in unusual cases) by either repossessing the goods or applying for a deficiency judgment.

There would be no excuse for seeking the "two remedies" (repossession and deficiency judgment), instances of which are so numerous in cases coming before Judge Gillis in his "poor man's court."

Excessive financing charges and high-pressure selling with little or no down payment—instances of these instalment selling malpractices are revealed in the following digest of cases from conciliation court records:

CASE NO. 1: HIGH FINANCING

In this case, the housewife reported to the court that she answered an advertisement and purchased a stove from an appliance firm for $29.50. She signed a blank contract.

After purchasing the stove, she bought a lighter for it for $5, a total of $34.50, which, with sales tax, brought the amount up to $35.54. She paid $3.70 down. Later she received a book from a finance company, to which the store had sold the contract, showing her total as $49.32.

The finance company later sued for back payments amounting to $20.53, and took a judgment for $20.55 and $2 costs. Two days later, the finance company took back the stove, despite the fact that, at the time its men called to repossess, the woman was using the stove.

Apparently the finance charge is $15.78 on a $35 balance. Here is a case in which the finance company took a judgment for partial payments, and then took back the merchandise for the unpaid balance.

The woman lost the stove, but still owes the judgment.

CASE NO. 2: EATING THE CAKE AND HAVING IT, TOO

Defendant purchased an electric refrigerator for $199.79 on a lease which is in the nature of a conditional sale. He paid $10 down, and agreed to pay $7.91 a month on the balance.

He missed payments, and judgment was taken against him by the company selling the refrigerator in the amount of $67.28, which was the amount he was in arrears, although the balance due on the whole account was $100.96.

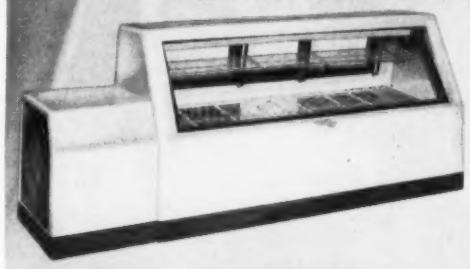
Court file on the case shows that, about five months later, a constable seized the refrigerator on an execution, and sold the same at the office of the company which made the original sale, to that company, for $27, charging $10 costs, and crediting the defendant with $17, leaving a balance on the judgment of $52.28, also leaving the defendant liable for a balance of $31.55 on the unpaid account.

Defendant filed a petition in conciliation court, and the court entered a stop order on payments to the plaintiff, pending adjustment.

This case is cited by the court as an example of the plaintiff taking advantage of its conditional sale or title-retaining contract by taking judgment and then seizing the chattel, leaving the defendant liable for the balance of payments due.

(Editor's Note: *Records of other cases will be published in later issues.*)

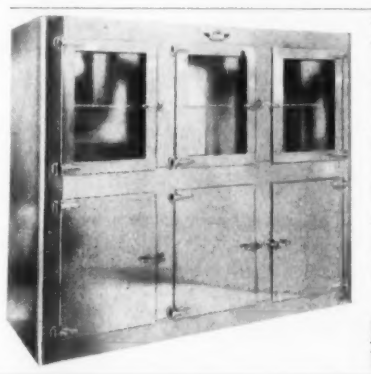
A BOMB SHELL
THE Sensational
NEW ECON-O-CASE



In design, in construction, in performance, this new display case is a sensation. Yet it is low in price and economical to operate. The Koch line is complete. There is a counter, a cooler, or a refrigerator that will meet every requirement.

WRITE KOCH TODAY
There is big money in the Koch line for qualified distributors.

KOCH REFRIGERATORS
NORTH KANSAS CITY, MISSOURI



New As Tomorrow

and just what the live distributor has been waiting for.

A Reach-In of lifetime 18-8 Enduro Stainless Steel.

A variety of models and sizes.

Style—Quality—Beauty—Endurance.

An article in demand by the quality buyer.

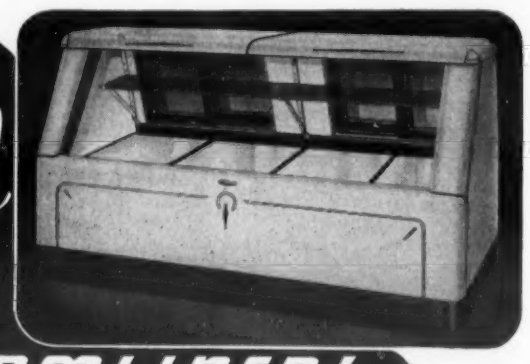
An Amazingly low price.

A worth-while direct factory discount.

Write

BROMANN BROS., Inc.
Fulton & Peoria Sts. Chicago, Illinois

NEW Percival STREAMLINER!



DISTRIBUTORS WANTED!

Write for details of Profit-making franchise. Complete PERCIVAL line meets *every* requirement of the modern food store.

Modern styling . . . Beautiful design . . . Outstanding construction . . . Economical operation! TOMORROW'S case, presented TODAY! Get the jump on other distributors by selling this modern marvel of electrical refrigeration. Its NEW style and NEW features give you exclusive selling advantages! NEW PERCIVAL FINANCE PLAN HELPS YOU SELL.

C. L. PERCIVAL COMPANY
DES MOINES . . . . . IOWA
51 YEARS OF SERVICE 1886-1937

PELCO DEALERS Reach Profitable Volume in 30 Days

PELCO is no "it takes a year to lay the groundwork" product—acceptance is almost instantaneous. Here are some reasons why: RICH APPEARANCE; AUTOMATIC—keeps itself supplied with FLOATING ICE as needed; DOUBLE UTILITY—the world's finest beverage cooler plus a roomy "dry-cold" refrigerator;—REFINEMENTS in building—protected coils of seamless copper, non-corrosive oversize drain, heavy chrome-plated hardware; STURDY, rugged construction; SUPER-POWERED.

Send for MORE FACTS. Address Desk A-28

MANUFACTURED BY Refrigerator Division
PORTABLE ELEVATOR MFG. CO.
BLOOMINGTON, ILLINOIS, U. S. A.
Sold in Canada by UNIVERSAL COOLER CO., of Canada, Limited, Brantford, Ontario

PELCO Electric BEVERAGE and BEVERAGE-FOOD Cooler
MAKES ITS OWN Floating Ice

MODEL 200 BEVERAGE AND FOOD COOLER
MODEL 240 BEVERAGE COOLER

Magazine Advertising Expenditures On Electric Refrigerators in 1937

Frigidaire

Frigidaire Division, General Motors Corp.

The American Weekly	$108,000
Saturday Evening Post	98,300
Collier's	63,000
Woman's Home Companion	52,386
This Week	46,600
Good Housekeeping	40,720
McCall's	39,690
Liberty	31,250
Cosmopolitan	23,520
Household	18,810
True Story	18,100
American	16,380
Better Homes & Gardens	16,065
Time	12,229
American Home	12,070
Life	10,350
National Geographic	9,750
Holland's	5,400
Graduate Group	4,950
Total	**$627,570**

Norge

Norge Division, Borg-Warner Corp.

The American Weekly	$274,000
This Week	166,650
Saturday Evening Post	40,000
Good Housekeeping	37,800
Total	**$518,450**

Westinghouse

Westinghouse Electric & Mfg. Co.

Saturday Evening Post	$110,400
The American Weekly	108,000
This Week	70,800
Collier's	59,940
Ladies' Home Journal	25,000
McCall's	21,020
Good Housekeeping	18,900
American	14,000
Cosmopolitan	14,000
American Home	9,600
Forbes	800
Total	**$452,460**

Electrolux (Gas)

Servel, Inc.

Saturday Evening Post	$103,000
The American Weekly	90,000
Collier's	54,000
Good Housekeeping	46,600
Liberty	38,700
Better Homes & Gardens	20,250
True Story	19,800
American	18,000
American Home	17,000
Time	15,225
Life	12,000
Sunset	2,000
Total	**$436,575**

General Electric

General Electric Co.

Saturday Evening Post	$119,025
Collier's	66,990
Ladies' Home Journal	63,825
Good Housekeeping	34,650
American	33,000
Better Homes & Gardens	22,090
American Home	21,120
House Beautiful	7,200
House & Garden	7,020
Holland's	3,600
Sunset	2,200
Total	**$380,720**

Kelvinator

Kelvinator Division, Nash-Kelvinator Corp.

Saturday Evening Post	$ 46,000
This Week	40,000
The American Weekly	39,237
Woman's Home Companion	27,225
Collier's	26,400
True Story	21,800
Liberty	14,190
Life	13,800
American	9,900
Holland's	6,600
Graduate Group	6,000
Total	**$251,152**

Crosley

Crosley Radio Corp.

The American Weekly	$ 21,420
Saturday Evening Post	15,820
McCall's	13,135
Good Housekeeping	11,602
Time	11,510
Liberty	9,690
This Week	4,968
Ladies' Home Journal	4,316
Collier's	3,996
True Story	3,800
Woman's Home Companion	3,772
Cosmopolitan	3,384
Pictorial Review	3,240
American	3,168
Fawcett Women's Group	2,852
National Geographic	2,800
Better Homes & Gardens	2,736
Life	2,580
Household	2,520
Modern Magazine	2,136
Literary Digest	1,944
Woman's World	1,872
New Yorker	1,844
Red Book	1,728
American Home	1,584
Esquire	1,282
Parents'	1,268
Home Arts Needlecraft	1,152
News-Week	1,038
Vogue	940
Harper's Bazaar	900
Popular Mechanics	900
Photoplay	796
Popular Science	792
Detective Group	736
McFadden Women's Group	713
Fortune	700
House Beautiful	624
House & Garden	600
Christian Herald	476
National Parent Teacher	432
Delineator	375
Stage	320
Town & Country	252
Country Life	236
Junior League	212
Arts & Decoration	200
Scientific American	200
Spur	176
Total	**$153,737**

Leonard

Leonard Division, Nash-Kelvinator Corp.

Saturday Evening Post	$ 23,500
Collier's	14,700
True Story	11,950
Liberty	7,170
Total	**$ 57,320**

Hotpoint

Edison General Electric Appliance Co., Inc.

Saturday Evening Post	$ 36,500
Collier's	20,400
Total	**$ 56,900**

Fairbanks-Morse

Fairbanks, Morse & Co.

Saturday Evening Post	$ 20,000
Good Housekeeping	12,600
Collier's	9,000
Total	**$ 41,600**

Apex

Apex Electrical Mfg. Co.

Good Housekeeping	$ 25,200

Universal

Landers, Frary & Clark

Saturday Evening Post	$ 8,000

Copeland

Copeland Refrigeration Corp.

Saturday Evening Post	$ 4,000

Sparton

Sparks-Withington Co.

Good Housekeeping	$ 2,152

Swope Points to Great Reductions Made in Prices over Decade

SCHENECTADY, Jan. 10—Orders received by General Electric Co. in the fourth quarter of 1937 amounted to $73,997,063, compared with $84,857,181 in the same period of 1936, a decrease of almost 13%, President Gerard Swope announced today.

For nine months the total was $305,276,556, compared with $211,891,038 for nine months of 1936, an increase of 44%, making total orders for the year $379,273,619 compared with $296,748,219 for 1936, an increase of 28%.

Mr. Swope stated that in every major department of the company, orders were greater in 1937 than in 1936. He also stated that in spite of the increased cost of labor and material, improvements in design and better manufacturing methods had enabled the company to maintain the trend toward lower costs so that reasonable selling prices might stimulate an increased demand.

It was pointed out that there have been impressive reductions in prices of appliances, as illustrated by the following: an electric refrigerator which sold for $270 in 1928 now sells for $172, a reduction of 36% from the price 10 years ago, and the cost of its operation today is less than half as much as in the earlier period; an electric range which could be purchased for $156 in 1928, is now priced at $87, a reduction of 44%; an electric washer which sold for $100 in 1930 at present sells for $47, a reduction of 53%; a radio receiver which sold for $73 in 1931 now sells for $20; and an electric clock which was priced at $10 in 1930 now sells for $3.50.

Lavigne Opens Store In Louisiana

PONTCHATOULA, La. — H. J. Lavigne has announced the opening in his store of an electrical appliance department which will feature General Electric refrigerators, washers, and radios.

Advertising Spending For Magazines in 1937 Increased

(Concluded from Page 1, Column 3)

national magazine advertising of its Electrolux refrigerator last year, with the sum being spread over an even dozen publications.

General Electric Co. spent $380,720 in 11 national magazines, major portion of this amount going to Saturday Evening Post, Collier's, and Ladies' Home Journal. Kelvinator division, Nash-Kelvinator Corp., had expenditures during 1937 of $251,152, including the national magazine advertising of its Kelvin Home contest.

Crosley Radio Corp. spread its 1937 advertising expenditure of $153,737 through 48 national magazines, by far the largest number of publications used by any company in the major appliance industry during the year.

Leonard division, Nash-Kelvinator Corp., spent $57,320 in four national magazines, and Edison General Electric Appliance Co., Inc., spent $56,900 in two publications. Fairbanks, Morse & Co. spent $41,600 during 1937, dividing the sum between Saturday Evening Post, Good Housekeeping, and Collier's.

Four companies—Landers, Frary & Clark, Copeland Refrigeration Corp., Sparks-Withington Co., and Apex Electrical Mfg. Co., spent their 1937 appliance advertising appropriations in one publication.

Distributor Puts Up Price Control Fund

(Concluded from Page 1, Column 4)

professional shoppers to canvass all Brooklyn dealers handling Stewart-Warner appliances and report their findings to the judicial committee.

Recommendations of the committee as to the continuation or cancellation of franchises held by dealers violating the code will be followed by Wholesale Radio, Mr. Peters said.

To aid enforcement of the Feld-Crawford contract, said to be the first issued in 1938 by any New York refrigerator distributor, Wholesale Radio's attorney and secretary will cooperate with the association, according to Mr. Peters.

James Boyd Named Eastern Westinghouse Manager

NEW YORK CITY—James Boyd, formerly assistant eastern district manager, has been appointed eastern district manager of Westinghouse Electric & Mfg. Co. to succeed H. F. Boe, who has become commercial manager of the company with offices in Pittsburgh. Mr. Boyd's headquarters will be in the Westinghouse building here.

Joining Westinghouse 21 years ago as service engineer, Mr. Boyd was transferred in 1920 to the sales department, New York City office, as salesman in the general industry section. In 1925 he was promoted to supervisor of the general mill section, and in 1935 became eastern industrial manager.

G-M Plants Establish New Safety Record

NEW YORK CITY—With a record of only 5.15 lost-time accidents for every 1,000,000 man-hours of work in its 81 plants in the United States and Canada, General Motors Corp. has reported that 1937 was the best year in its history for the safety of its employes.

The 1937 record was made despite an increase of more than 10,000,000 hours worked over 1936, making the total work-hours for all plants more than 384,000,000.

Frequency of accidents, it is reported, is now only one fourth of the 1929 rate.

A large part of the credit for the record is attributed to a nation-wide safety contest held during the first six months of the year.

The 266 foremen making the best contributions were awarded radios by Alfred P. Sloan, Jr., chairman of the board.

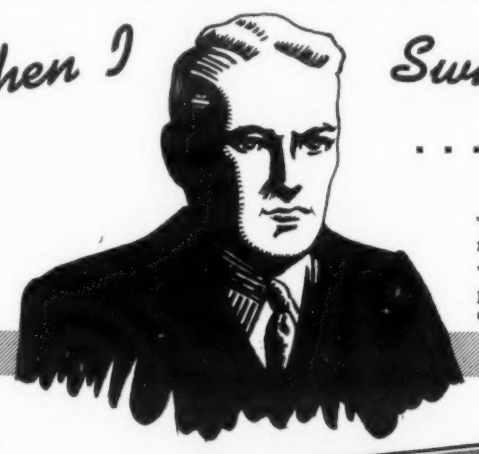
In General Motors plants in Dayton, including Frigidaire, Delco Products, Inland, and three other divisions, 38,282,983 man-hours were worked in 1937 with only three lost-time accidents for every 1,000,000 hours.

Filbert Goes to California

OAKLAND, Calif.—F. Q. Filbert, formerly Servel, Inc. sales promotion representative at Houston, Tex., has been appointed district sales manager for the northern California territory. He will make his headquarters here.

"Then I Switched to A-P Valves . . . and Trouble STOPPED!"

(A typical remark from a Service Engineer)



"Here's one reason I prefer A-P Valves on all my 'Year's Warranty' installations.

"Superheat Adjustment on other valves is difficult and complicated. But not on the A-P. Just remove the bottom nut and your adjusting stem is right out in front of you."

INSTALLATION
Elm Grove Store
Elm Grove, Wis.
CABINET
Campbell Refrigerator Co., Milwaukee, Wis.
REFRIGERATION UNIT
York

VALVES — A-P

Purchased through Refrigeration Specialty Co., Milwaukee Wis.

The "Switch" to A-P Valves is spreading to all phases of Air Conditioning and Refrigeration—Commercial Cabinets, Store Air Conditioning installations of every size and type,—Huge Hotel and Industrial Refrigeration and Air-Conditioning.

The Service Engineer working on every job can give you many reasons for A-P Preference—in definite terms of Service-Free and Trouble-Free operation.

A-P Refrigeration Valves are far ahead of their time in design and construction—in super-sensitivity, accuracy of control that invariably mean a Profitable Installation.

AUTOMATIC PRODUCTS COMPANY

2450 NORTH THIRTY — SECOND STREET

MILWAUKEE WISCONSIN

A-P Refrigeration Valves . .

DEPENDABLE

THE BYWORD FOR A-P CONTROLS

Air Conditioning & Refrigeration News

Trade Mark Registered U. S. Patent Office. Established 1926 as Electric Refrigeration News
Entered as second-class matter Aug. 1, 1927. Copyright, 1938, by Business News Pub. Co.

VOL. 23, NO. 6, SERIAL NO. 464
ISSUED EVERY WEDNESDAY

DETROIT, MICHIGAN, FEBRUARY 9, 1938

IN TWO PARTS, PART TWO
TWENTY CENTS PER COPY

In this section: 1938 SPECIFICATIONS

195 Models of Household Electric Refrigerators

Made by 16 Manufacturers (Nema Companies Only)

IN this supplement (Part 2 of the February 9 issue of AIR CONDITIONING & REFRIGERATION NEWS) will be found the 1938 specifications for 195 models of household electric refrigerators manufactured by 16 companies which are members of the Household Refrigeration Section of the Refrigeration Division of National Electrical Manufacturers Association (Nema).

For several years prior to 1937 the NEWS collected specifications of household electric refrigerators by means of questionnaires sent directly to each manufacturer. In the latter part of 1936, however, the manufacturers which are in the Nema group decided to publish and copyright the specifications of their 1937 models and refrigerators which they manufacture for other merchandising organizations.

The Nema member companies furthermore decided not to make public any further details of specifications other than those officially published under their auspices.

The copyrighted data on the new 1938 models in this section of the NEWS is published with the permission of the Refrigeration Division of Nema.

The NEWS is pleased to have this opportunity to present to its readers, so early in the season, this official compilation of comparative data and gratefully acknowledges the cooperation of the Nema organization.

Since readers all over the world have come to depend upon the NEWS to supply information regarding the products of *all* manufacturers, large and small, additional data on the 1938 models of other makes, not included in the Nema group, will be collected and published in a later issue.

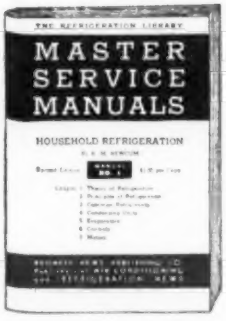
Unless announced otherwise, *another Specifications Supplement* will be published with the MARCH 9 ISSUE. It will contain data on *all models* of *all makes* (including the Nema data appearing in this Supplement). Those ordering extra copies of these Specifications Issues should be sure to state *which issue* is desired, i.e. the current issue (Feb. 9) containing Nema data only, or the coming (March 9) which will cover *all makes* for which data is available.

Note: Single copy price, 20 cents. Ten or more copies, 15 cents each; 50 or more copies, 10 cents each; postpaid to one address anywhere in the world. Please send remittance with order.

MASTER SERVICE MANUALS

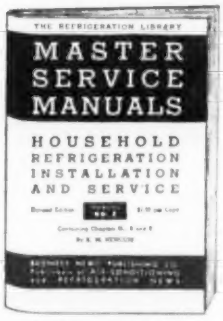
By K. M. Newcum

Household Refrigeration



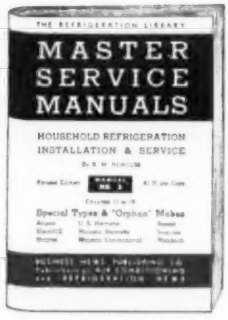
Household
Manual No. 1

MANUAL NO. 1 — The theory and principles of refrigeration explained in simple terms. Characteristics of the various refrigerants in common use. An explanation of the construction and operation of the major component parts of a household electric refrigerator including the condensing unit, evaporator, control and motor. 144 pages. Price $1.00.



Household
Manual No. 2

MANUAL NO. 2—Diagrams show how to distinguish the difference between the fundamental types of systems. Detailed instructions regarding the proper methods of installing and servicing each type. This book is a comprehensive guide to the servicing of all the popular makes of household electric refrigerators. 128 pages. Price $1.00.



Household
Manual No. 3

MANUAL NO. 3—Detailed information regarding methods of servicing several special types of refrigerators (now classified as "orphan makes" because production of these models has been discontinued) including Allison, ElectrICE, Holmes, U. S. Hermetic, Majestic Hermetic, Majestic Conventional, Socold, Iroquois, and Welsbach. 144 pages. Price $1.00.

Master Service Manuals on HOUSEHOLD refrigeration, installation and service provide a complete and inexpensive course of study for the beginner and valuable reference books for the experienced service man. The author, K. M. Newcum has taught classes of beginners and advanced students at David G. Rankin School of Mechanical Trades, St. Louis, Mo. and West Side Y. M. C. A., New York, N. Y.

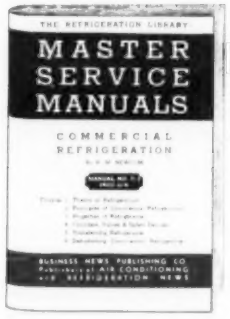
Master Service Manuals are now being used as textbooks by Technicians Institute, 244 N. 14th St., New York City; Universal Refrigeration and Air Conditioning School, 352 Fourth Ave., New York, N. Y.; Humboldt Adult Educational Center, 314 E. Ferry, Buffalo, N. Y.; Louisville Institute of Technology, Louisville, Ky.; Hower Trade Evening School, Akron, Ohio, and other trade and technical schools.

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Michigan

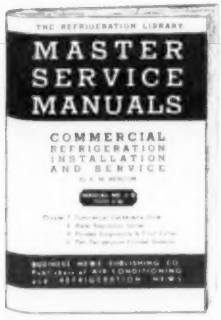
MASTER SERVICE MANUALS

By K. M. Newcum

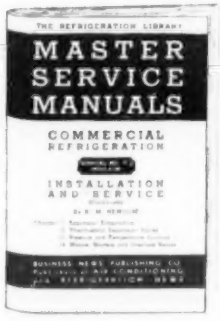
Commercial Refrigeration



Commercial Manual C-1



Commercial Manual C-2



Commercial Manual C-3

MANUAL NO. C-1 The theory and principles of refrigeration presented in a more complete manner than in previous manuals. Properties of refrigerants, including effect on lubricating oils, inflammability and explosive characteristics. Types of refrigerant cylinders, valves, and safety devices. Drying and transferring refrigerants. 96 pages. Price $1.00.

MANUAL NO. C-2 Installation and service methods. Detailed information on commercial condensing units and their component parts. Water regulating valves, both electric and pressure-actuated types. Flooded evaporators and low side float valves. Two-temperature low side float valve flooded systems. 112 pages. Price $1.00.

MANUAL NO. C-3 Installation and service methods continued. Chapters on expansion evaporators, including blower units and all modern types. Thermostatic expansion valves. Pressure and temperature controls. Refrigerant control valves. Electric motors, starters, overload relays, 144 pages. Price $1.00. Complete set of three books, postpaid $3.00.

Master Service Manuals on COMMERCIAL refrigeration offer an advanced course of study dealing with the more complicated problems encountered in a wide variety of commercial refrigeration applications. Most textbooks on refrigeration are based upon practice of ice and cold storage companies and deal entirely with ammonia type machines, whereas a very large percentage of the installations now in use and the equipment now being sold, use Freon, sulphur dioxide, or methyl chloride. These books are entirely modern and deal with designs and problems, installation and service which are met in actual commercial practice today.

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Michigan

RECOMMENDED STANDARD METHOD OF COMPUTING THE GROSS VOLUME, THE NET FOOD STORAGE VOLUME AND THE FOOD SHELF AREA OF DOMESTIC REFRIGERATORS

Adopted by Refrigeration Division—NEMA, May 18, 1931

INSIDE DEPTH—The inside depth of the cabinet shall be the distance between the inside door pan and the rear lining.

INSIDE WIDTH—The inside width shall be the distance between the inner surfaces of the side walls of the lining.

INSIDE HEIGHT—The inside height shall be the distance between the inner surfaces of the floor and ceiling of the cabinet.

GROSS CUBIC CONTENT—The gross cubic content of any refrigerator cabinet shall be the product of the inside height, inside depth and inside width as defined above.

NET FOOD STORAGE VOLUME—The net food storage volume shall be the gross cubic content minus the volume taken up by the cooling unit, baffles or other parts, plus the volume of the ice freezing or food storage compartments contained within the cooling unit.

DEPTH OF COOLING UNIT—(a) The depth of the cooling unit shall be taken as the depth of the cabinet as heretofore defined.

(b) Exceptions to this may be noted only if there is a clear space of four inches or greater in front or back of the cooling unit baffle, or ice tray pulls, to the inside front or back of the cabinet as measured for depth and this space arranged for food storage.

(c) In this case the depth of the cooling unit shall be taken as the distance from the rear wall of the inner liner to the foremost part of the cooling unit, ice tray pulls, or baffle, whichever is the greater, or from the inner surface of the door to the rearmost portion of the cooling unit.

WIDTH OF COOLING UNIT—(a) The width of the cooling unit shall be taken as the greatest outside width of the cooling unit itself, or if side baffles are used, the over-all width including the baffles, whichever is the greater.

(b) If there is less than a four inch space between the unit or baffle and the side of the inner lining, the distance from the inner lining to the outer surfaces of the cooler unit or baffle (whichever is the greater) shall be used as the width.

HEIGHT OF COOLING UNIT—(a) The height of the cooling unit shall be the distance from the ceiling of the cabinet as previously used for inside height to a plane horizontal with a mean point on the bottom of the drip tray or the lower baffle, whichever is the greater.

(b) On non-automatic defrosting type cooling units the space occupied by the drip tray may be included in the net food storage volume if the drip tray is of the removable type and usable as food storage space.

(c) The space directly above the cooling unit shall not be included in the net cubic volume except in cases where the unobstructed storage space is greater than four inches in height specifically arranged for food storage and is readily accessible.

(d) The volume of the ice freezing compartments or low temperature food storage compartments shall be included in the net food storage volume.

(e) The volume of these ice freezing compartments shall be calculated from the inside dimensions of the sleeve.

(f) In the case of low temperature food storage compartments, the net volume shall be computed as heretofore defined, each compartment being considered as a separate refrigerator.

FOOD STORAGE SHELF AREAS—(a) Food storage shelf area shall include the area of shelves and the area of the bottom of the liner as hereinafter defined.

(b) In calculating the area of full shelves and of the bottom of the liner, the inside width and depth of the cabinet, as previously defined, shall be used.

(c) When any shelf is recessed, the area of the recess shall be deducted. The width and depth of the recess shall be the distance from the edges of the recess to the adjacent interior surfaces as used in figuring gross storage volume.

(d) In computing the area of fractional shelves, the width and depth of the shelves shall be the distances from the adjacent interior surfaces of the cabinet to the outer edges of the shelf.

(e) For fractional shelves adjoining the evaporator compartment, the width of the shelf shall be the interior width of the cabinet minus the width of the evaporator compartment as heretofore defined under "Width of Cooling Unit."

(f) Whenever the space occupied by the drip tray is included in the net food storage volume, the part of the shelf supporting the drip tray may be considered as food shelf area; otherwise it shall not.

(g) The area of the bottom of the individual ice freezing or low temperature storage compartments, included as a part of the cooling unit, shall be considered as food shelf area; the width and depth dimensions used in computing their volumes to be used in calculating the food shelf area.

(h) The area of the bottom of containers arranged to be suspended from any cabinet shelf shall be considered as food storage shelf area.

(i) The area of that part of the shelves having less than four inches of clearance above shall not be counted, except as otherwise specified in (f), (g), and (h).

VOLUMES AND AREAS—(a) Gross and net food storage volumes shall be reported to the nearest 0.1 cu. ft.

(b) Food shelf areas shall be reported to the nearest 0.1 sq ft.

1938

SPECIFICATIONS

OF

HOUSEHOLD ELECTRIC REFRIGERATORS

MANUFACTURED BY MEMBERS

OF

REFRIGERATION
DIVISION • NEMA

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APEX

	SC-300	SC-400	C-525	SC-600	C-625	C-710	C-800	AC-610	AC-710	DC-1	DC-2	DC-3
Name of Manufacturer	The Apex Electrical Manufacturing Co., Cleveland, O.											
Model No.												
Exterior Cabinet Finish	Perma-Glo		Dulux Perma-Glo			Dulux				Perma-Glo		
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)												
Net Food Storage (Cu. Ft.)	3.00	4.00	5.25	6.00	6.25	7.10	8.00	6.10	7.10			
Total Shelf Area (Sq. Ft.)	5.8	8.2	10.7	11.8	12.9	15.6	18.8	11.5	14.2	....	....	....
Interior Finish	Porcelain									....	....	....
Overall Height (Inches)	43 5/8	49 5/8	55	56 1/8	58	58	61	56 1/2	59	56 1/2	62	62
Overall Width (Inches)	23 1/4	23 3/4	31 1/4	30 1/2	31 1/4	31 1/4	31 1/4	30 1/2	30 1/2	30 1/4	30 1/4	34 1/4
*Overall Depth (Inches)	19 1/2	20	21 3/4	22 1/2	21 3/4	23 1/4	23 1/4	22 7/8	23 3/8	24 1/4	24 1/4	24 1/4
										General Storage / Frozen Storage	General Storage / Frozen Storage	General Storage / Frozen Storage
Inside Height (Inches)	21 1/4	27 1/2	27 1/2	30 1/2	33	35	38	30 1/2	34 1/2	16 7/8 / 10 1/2	22 3/8 / 10 1/2	22 3/8 / 10 1/2
Inside Width (Inches)	19	19	24 7/8	24	24 7/8	24 7/8	24 7/8	24	24	24 / 20	24 / 20	28 / 24
Inside Depth (Inches)	14 1/2	14 1/2	14 1/2	15 1/2	14 1/2	15 1/2	16	15 7/8	16 3/8	16 9/16 / 15 3/8	16 9/16 / 15 3/8	16 9/16 / 15 3/8
Number of Doors	1	1	1	1	1	1	1	1	1	2	2	2
Insulation	Glass Wool									Balsam Wool		
ICE TRAYS												
Total Number of Trays	2	2	2	2	5	5	5	3	4	3	3	4
Total Weight of Ice (Lbs.)	4.4	4.4	4.6	4.6	8.8	8.8	8.8	6.6	8.8	6.6	6.6	8.8
Total Number of Cubes	56	56	56	63	112	112	112	84	112	84	84	112
Number of Trays/Lbs. Each	2-2.2	2-2.2	1-3.2	1-1.4	2-1.4	2-1.4	2-1.4	2-2.2	3-2.2	2-2.2	2-2.2	3-2.2
Material of Above	Aluminum											
Number of Trays/Lbs. Each	....	....	1-1.4	....	2-1.4	2-1.4	2-1.4	1-2.2	1-2.2	1-2.2	1-2.2	1-2.2
Material of Above	Aluminum with Rubber Grids											
Number of Trays/Lbs. Each	....	....	....	1-3.2	1-3.2	1-3.2	1-3.2	....	....	....	....	....
Material of Above	....	....	....	Aluminum				....	....	....	....	....
COMPRESSOR												
Location	Below											
Open or Sealed	Open											
Reciprocating or Rotary	Reciprocating											
Refrigerant Used	Sulphur Dioxide							Freon-12				
CONDENSER												
Type	Fin and Tube											
How Cooled	Air Blast from Motor Fan											
WEIGHT (COMPLETE REFRIGERATOR)												
Net Weight (Lbs.)	....	....	....	....	....	....	....	....	....	....	....	....
Shipping Weight (Lbs.) (Approx.)	260	280	375	350	400	425	435	350	375	385	410	450
GUARANTEE												
Cabinet, Shelves, Trays and Accessories	1 Year											
Refrigeration System Only	1 Year Plus 4 Year Optional											
Controls	1 Year											

*Less Hardware.

BRIGGS

Name of Manufacturer	Johnson Motors, Refrigeration Division, Galesburg, Ill.			
Model No.	BGS-4	BGS-6	BGT-6	BGT-8
Exterior Cabinet Finish	Dulux			
Retail Installed Price	....	....	....	....
CAPACITY (NEMA Rating)				
Net Food Storage (Cu. Ft.)	4.17	6.31	6.31	7.85
Total Shelf Area (Sq. Ft.)	8.54	9.79	9.79	13.02
CABINET				
Interior Finish	Porcelain			
Overall Height (Inches)	52 1/2	59 1/4	59 1/4	63
Overall Width (Inches)	24 3/8	29	29	31 7/8
Overall Depth (Inches)	24	24	24	25
Inside Height (Inches)	26	31 1/2	31 1/2	35 1/2
Inside Width (Inches)	19	23 5/8	23 5/8	25 1/2
Inside Depth (Inches)	16	16	16	16
Number of Doors	1	1	1	1
Insulation	Balsam Wool			
ICE TRAYS				
Total Number of Trays	2	3	3	3
Total Weight of Ice (Lbs.)	5	10	10	10
Total Number of Cubes	42	84	84	84
Number of Trays/Lbs. Each	2-2 1/2	2-2 1/2	2-2 1/2	2-2 1/2
Material of Above	Aluminum			
Number of Trays/Lbs. Each	....	1-5	1-5	1-5
Material of Above	Aluminum			
Number of Trays/Lbs. Each	....	....	....	....
Material of Above	....	....	....	....
Number of Special Trays	....	....	....	....
COMPRESSOR				
Location	Below			
Open or Sealed	Open			
Reciprocating or Rotary	Reciprocating			
Refrigerant Used	Sulphur Dioxide			
CONDENSER				
Type	Finned Tube			
How Cooled	Air from Motor Fan			
WEIGHT (COMPLETE REFRIGERATOR)				
Net Weight (Lbs.)	250	295	300	340
Shipping Weight (Lbs.)	300	355	360	410
GUARANTEE				
Cabinet, Shelves, Trays and Accessories	1 Year			
Refrigeration System Only	1 Year Plus 4 Year Optional			
Controls	1 Year			

COLDSPOT

Name of Manufacturer	Sunbeam Electric Mfg. Co., Evansville, Ind. (Cabinets: Sunbeam and Seeger)						
Model No.	3874	3804	3806	3836	3816	3838	3818
Exterior Cabinet Finish	Dulux						
Retail Installed Price	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)							
Net Food Storage (Cu. Ft.)	4.2	4.2	6.2	6.4	6.3	8.6	8.6
Total Shelf Area (Sq. Ft.)	9.6	8.5	11.5	13.6	13.6	16.2	16.2
CABINET							
Interior Finish	Porcelain						
Overall Height (Inches)	49 3/4	51 13/16	57 1/16	59 11/16	59 11/16	62 15/16	62 15/16
Overall Width (Inches)	23 7/8	23 7/8	30	30 1/2	30 1/2	34 1/8	34 1/8
Overall Depth (Inches)	25 1/4	25 1/4	26 13/16	26 5/16	26 5/16	27 3/8	27 3/8
Inside Height (Inches)	27 1/4	27 1/4	31 15/16	33 7/8	33 7/8	37 1/8	37 1/8
Inside Width (Inches)	19 1/2	19 1/2	23 5/8	23 5/8	23 5/8	27 1/4	27 1/4
Inside Depth (Inches)	15 7/16	15 1/16	15 5/8	14 3/4	14 3/4	15 11/16	15 11/16
Number of Doors	1	1	1	1	1	1	1
Insulation	Glass Wool		Dry Zero				
ICE TRAYS							
Total Number of Trays	2	2	3	5	5	5	5
Total Weight of Ice (Lbs.)	5	5	7 1/2	9	10 1/2	13	13
Total Number of Cubes	64	64	96	106	112	138	138
Number of Trays/Lbs. Each	2-2 1/2	2-2 1/2	3-2 1/2	1-3 1/4	1-4	1-5	1-5
Material of Above	Aluminum						
Number of Trays/Lbs. Each	....	....	....	3-1 1/4	2-1 1/4	2-2	2-2
Material of Above	Aluminum						
Number of Trays/Lbs. Each	....	....	....	1-2	2-2	2-2	2-2
Material of Above	....	....	....	Aluminum			
Number of Special Trays	....	....	....	1	2	2	2
COMPRESSOR							
Location	Above						
Open or Sealed	Open						
Reciprocating or Rotary	Rotary						
Refrigerant Used	Sulphur Dioxide						
CONDENSER							
Type	Tube and Fin						
How Cooled	Fan						
WEIGHT (COMPLETE REFRIGERATOR)							
Net Weight (Lbs.)	201	235	316	341	337	406	410
Shipping Weight (Lbs.)	260	294	380	420	416	480	484
GUARANTEE							
Cabinet, Shelves, Trays and Accessories	1 Year						
Refrigeration System Only	5 Year Protection Plan						
Controls	1 Year						

CROSLEY

	KB-30	KB-31	KB-36	KB-43	KB-50	KB-60	KB-71	KL-43	KL-50	KL-61	KL-71
Name of Manufacturer	The Crosley Radio Corporation, Cincinnati, Ohio										
Model No.											
Exterior Cabinet Finish	← Dulux →										
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)											
Net Food Storage (Cu. Ft.)	3.00	3.16	3.6	4.3	5.07	6.00	7.1	4.3	5.03	6.1	7.1
Total Shelf Area (Sq. Ft.)	6.92	7.24	8.07	8.49	11.98	14.43	16.77	9.9	12.62	15.8	16.77
CABINET											
Interior Finish	← Porcelain →										
Overall Height (Inches)	36	46 5/16	51 1/8	53 15/16	56 1/2	58 7/16	58 7/8	56 5/8	56 11/16	58 9/16	58 7/8
Overall Width (Inches)	23 5/8	23 5/8	23 7/8	23 7/8	27	30 3/4	32 3/4	23 7/8	27	29 3/8	32 3/4
*Overall Depth (Inches)	25	27 3/4	24 7/8	24 7/8	24 13/16	25 5/16	29 1/8	26 9/16	26 5/8	28 13/16	29 1/8
Inside Height (Inches)	17	22	22 7/8	25 11/16	28 3/4	28 5/8	30 1/8	28 1/2	28 1/2	28 3/4	30 1/8
Inside Width (Inches)	19 1/8	16 3/8	18	18 3/4	20 3/4	24 1/2	25	17 3/8	20	22 5/8	25
Inside Depth (Inches)	18 5/16	17 5/8	17 13/16	17 13/16	16 7/8	16 7/8	18 5/8	17 11/16	17 11/16	18	18 5/8
Number of Doors	1	1	1	1	1	1	1	1	1	1	1
Insulation	← Glass Wool →										
ICE TRAYS											
Total Number of Trays	2	2	3	3	3	6	6	3	3	6	6
Total Weight of Ice (Lbs.)	3	3	6	6	9	12.5	12.5	6	9	11.5	11.5
Total Number of Cubes	42	42	77	77	77	161	161	70	70	140	140
Number of Trays/Lbs. Each	2-1.57	2-1.57	1-1.57	1-1.57	1-2.66	3-1.57	3-1.57	2-1.28	2-2.14	4-1.28	4-1.28
Material of Above	← Aluminum →										
Number of Trays/Lbs. Each	....	....	1-3.29	1-3.29	1-4.67	2-3.29	2-3.29	1-3.29	1-4.67	2-3.29	2-3.29
Material of Above	← Aluminum →										
Number of Trays/Lbs. Each	....	....	1-1.28	1-1.28	1-2.14	1-1.28	1-1.28	....	....	....	....
Material of Above			← Aluminum →								
COMPRESSOR											
Location	← Below →		← Above →								
Open or Sealed	← Both →										
Reciprocating or Rotary	← Reciprocating →										
Refrigerant Used	← Sulphur Dioxide or Freon-12 →										
CONDENSER											
Type	← Fin →										
How Cooled	← Still Air and Fan →										
WEIGHT (COMPLETE REFRIGERATOR)											
Net Weight (Lbs.)	209	223	218	238	262	298	321	275	288	323	346
Shipping Weight (Lbs.)	230	262	291	317	347	386	420	358	381	419	452
GUARANTEE											
Cabinet, Shelves, Trays and Accessories	← 1 Year →										
Refrigeration System Only	← 5 Years →										
Controls	← 1 Year →										

*Including hardware.

FAIRBANKS - MORSE

Name of Manufacturer	Fairbanks, Morse & Co. Home Appliance Division, Indianapolis, Indiana.								
Model No.	EX-4	EX-6	EL-5	EL-6	EL-7	E-4	E-5	E-6	E-7
Exterior Cabinet Finish	Dulux								
Retail Installed Price									
CAPACITY (NEMA Rating)									
Net Food Storage (Cu. Ft.)	4.43	6.25	5.22	6.25	7.21	4.43	5.22	6.25	7.21
Total Shelf Area (Sq. Ft.)	9.8	13.0	11.6	13.0	15.7	9.2	11.2	12.6	15.2
CABINET									
Interior Finish	Porcelain								
Overall Height (Inches)	$51\frac{1}{8}$	$57\frac{3}{16}$	$54\frac{3}{8}$	$57\frac{3}{16}$	$61\frac{9}{16}$	$51\frac{1}{8}$	$54\frac{3}{8}$	$57\frac{3}{16}$	$61\frac{9}{16}$
Overall Width (Inches)	$23\frac{7}{8}$	$28\frac{5}{8}$	$25\frac{1}{4}$	$28\frac{5}{8}$	$28\frac{5}{8}$	$23\frac{7}{8}$	$25\frac{1}{4}$	$28\frac{5}{8}$	$28\frac{5}{8}$
Overall Depth (Inches)	$23\frac{31}{32}$	$24\frac{13}{16}$	$24\frac{3}{32}$	$24\frac{13}{16}$	$24\frac{13}{16}$	$23\frac{31}{32}$	$24\frac{3}{32}$	$24\frac{13}{16}$	$24\frac{13}{16}$
Inside Height (Inches)	$24\frac{5}{8}$	$29\frac{1}{8}$	$27\frac{1}{2}$	$29\frac{1}{8}$	$33\frac{1}{2}$	$24\frac{5}{8}$	$27\frac{1}{2}$	$29\frac{1}{8}$	$33\frac{1}{2}$
Inside Width (Inches)	$18\frac{3}{4}$	$22\frac{1}{8}$	$19\frac{3}{4}$	$22\frac{1}{8}$	$22\frac{1}{8}$	$18\frac{3}{4}$	$19\frac{3}{4}$	$22\frac{1}{8}$	$22\frac{1}{8}$
Inside Depth (Inches)	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$	$17\frac{1}{2}$
Number of Doors	1	1	1	1	1	1	1	1	1
Insulation	Fibrous Glass								
ICE TRAYS									
Total Number of Trays	2	4	4	4	5	3	4	4	5
Total Weight of Ice (Lbs.)	5	$8\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$	$11\frac{1}{2}$	$6\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$	$11\frac{1}{2}$
Total Number of Cubes	63	84	98	91	112	77	98	91	112
Number of Trays/Lbs. Each	1-1.72	4-2.09	3-2.09	3-2.09	4-2.09	2-1.72	3-2.09	3-2.09	4-2.09
Material of Above	Aluminum								
Number of Trays/Lbs. Each	1-3.14		1-3.14	1-3.14	1-3.14	1-3.14	1-3.14	1-3.14	1-3.14
Material of Above	Aluminum								
COMPRESSOR									
Location	Below								
Open or Sealed	Open								
Reciprocating or Rotary	Reciprocating								
Refrigerant Used	Sulphur Dioxide								
CONDENSER									
Type	Finned								
How Cooled	Fan								
WEIGHT (COMPLETE REFRIGERATOR)									
Net Weight (Lbs.)	248	297	282	323	352	274	297	340	368
Shipping Weight (Lbs.)	303	366	342	392	425	329	357	409	441
GUARANTEE									
Cabinet, Shelves, Trays and Accessories	1 Year								
Refrigeration System Only	5 Year Protection Plan								
Controls	Temperature Control 1 Year								

FRIGIDAIRE

Name of Manufacturer ..... Frigidaire Division, General Motors Corporation, Dayton, Ohio

Model No.	D-3	Special 5-38	Special 6-38	Special 7-38	Master 4-38	Master 5-38	Master 6-38	Master 7-38	Master 8-38	De Luxe 5-38	De Luxe 6-38	De Luxe 7-38	De Luxe 8-38	Imperial
Exterior Cabinet Finish	← Dulux →									← Porcelain →				
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)														
Net Food Storage (Cu. Ft.)	3.1	5.1	6.1	7.2	4.1	5.1	6.1	7.2	8.25	5.1	6.1	7.2	8.25	13.1
Total Shelf Area (Sq. Ft.)	6.9	10.9	14.1	15.8	9.0	10.9	14.2	16.0	19.4	10.9	14.2	16.0	19.4	27.1
CABINET														
Interior Finish	← Porcelain →													
Overall Height (Inches)	$44^{5}/_{16}$	$53^{3}/_{8}$	$56^{15}/_{16}$	$57^{15}/_{16}$	$50^{3}/_{16}$	$54^{9}/_{16}$	$58^{3}/_{16}$	$59^{3}/_{16}$	$60^{3}/_{16}$	$54^{9}/_{16}$	$58^{3}/_{16}$	$59^{3}/_{16}$	$60^{3}/_{16}$	$64^{3}/_{4}$
Overall Width (Inches)	$22^{5}/_{8}$	$28^{3}/_{8}$	$30^{1}/_{16}$	$31^{1}/_{2}$	$24^{3}/_{16}$	$28^{1}/_{16}$	$29^{11}/_{16}$	$31^{1}/_{8}$	$32^{1}/_{4}$	$28^{1}/_{16}$	$29^{11}/_{16}$	$31^{1}/_{8}$	$32^{1}/_{4}$	$38^{1}/_{8}$
*Overall Depth (Inches)	$23^{9}/_{16}$	$24^{5}/_{16}$	$24^{5}/_{16}$	$25^{3}/_{8}$	$25^{1}/_{8}$	$25^{1}/_{8}$	$25^{1}/_{4}$	$25^{3}/_{16}$	$28^{5}/_{8}$	$25^{1}/_{8}$	$25^{1}/_{4}$	$25^{3}/_{16}$	$28^{5}/_{8}$	$31^{7}/_{8}$
Inside Height (Inches)	$23^{1}/_{4}$	$29^{1}/_{2}$	$33^{1}/_{8}$	$34^{1}/_{8}$	$27^{3}/_{8}$	$29^{1}/_{2}$	$33^{1}/_{8}$	$34^{1}/_{8}$	$35^{1}/_{8}$	$29^{1}/_{2}$	$33^{1}/_{8}$	$34^{1}/_{8}$	$35^{1}/_{8}$	$39^{13}/_{16}$
Inside Width (Inches)	$17^{7}/_{8}$	$22^{1}/_{2}$	$24^{1}/_{16}$	$25^{1}/_{2}$	$19^{3}/_{16}$	$22^{1}/_{2}$	$24^{1}/_{16}$	$25^{1}/_{2}$	$26^{5}/_{8}$	$22^{1}/_{2}$	$24^{1}/_{16}$	$25^{1}/_{2}$	$26^{5}/_{8}$	32
Inside Depth (Inches)	$13^{1}/_{4}$	$14^{1}/_{16}$	$14^{1}/_{16}$	$15^{1}/_{8}$	$14^{1}/_{16}$	$14^{1}/_{16}$	$14^{1}/_{16}$	$15^{1}/_{8}$	$17^{5}/_{8}$	$14^{1}/_{16}$	$14^{1}/_{16}$	$15^{1}/_{8}$	$17^{5}/_{8}$	$19^{11}/_{16}$
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Insulation	← Special Frigidaire →													
ICE TRAYS														
Total Number of Trays	2	3	4	6	2	4	6	6	6	4	6	6	6	8
Total Weight of Ice (Lbs.)	4.0	6.0	8.0	10.0	4.0	8.0	10.0	12.0	14.0	8.0	10.0	12.0	14.0	19.0
Total Number of Cubes	32	48	56	84	32	64	84	84	108	64	84	84	108	144
Number of Trays/Lbs. Each	2-2.0	3-2.0	4-2.0	6-1.66	2-2.0	4-2.0	6-1.66	6-2.0	6-2.38	4-2.0	6-1.66	6-2.0	6-2.38	8-2.38
Material of Above	← Aluminum →													
Number of Special Trays	2	3	4	6	2	4	6	6	6	4	6	6	6	8
COMPRESSOR														
Location	← Below →													
Open or Sealed	← Sealed →													
Reciprocating or Rotary	← Rotary →													
Refrigerant Used	← F-114 →													
CONDENSER														
Type	Plate ← Fin →													
How Cooled	← Natural Draft → Forced Air													
WEIGHT (COMPLETE REFRIGERATOR)														
Net Weight (Lbs.)	177	234	258	306	206	248	276	353	397	290	306	387	421	630
Shipping Weight (Lbs.)	207	305	341	404	286	336	361	456	536	389	418	506	566	853
GUARANTEE														
Cabinet, Shelves, Trays and Accessories	← 1 Year Warranty →													
Refrigeration System Only	← 5 Year Protection Plan →													
Controls	← 1 Year Warranty →													

*Includes door, hardware and space at rear for ventilation.

GENERAL ELECTRIC

Name of Manufacturer: General Electric Co., Cleveland, Ohio

Model No.	LK-2	B3-38	B4-38	B5-38	B6-38	B7-38	B8-38	JB5-38	JB6-38	JB7-38	PB5-38	PB6-38	PB8-38	PB12-38	PB16-38
Exterior Cabinet Finish	← Glyptal →										← Porcelain →				
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)															
Net Food Storage (Cu. Ft.)	2.0	2.8	4.0	5.0	6.1	7.1	8.1	5.0	6.1	7.1	5.0	6.1	8.1	12.0	16.1
Total Shelf Area (Sq. Ft.)	....	6.9	9.3	10.6	12.2	15.1	16.9	10.6	12.2	15.1	10.6	12.2	16.9	26.3	32.3
CABINET															
Interior Finish	← Porcelain →														
Overall Height (Inches)	36	36	49 9/16	53 9/16	56 1/2	60	60	53 9/16	56 1/2	60	53 9/16	56 1/2	60	67 3/16	67 3/16
Overall Width (Inches)	21	23 3/4	24	27 3/4	30	30	33	27 3/4	30	30	27 3/4	30	33	40	49
Overall Depth (Inches)	23 7/8	23 1/4	25 3/8	26 7/8	26 5/8	27 1/8	28 1/4	26 7/8	26 5/8	27 1/8	26 7/8	26 5/8	28 1/4	31 9/16	31 9/16
Inside Height (Inches)	13 1/4	17 1/16	28 1/2	28 1/2	32 7/16	35 15/16	35 15/16	28 1/2	32 7/16	35 15/16	28 1/2	32 7/16	35 13/16	37 1/8	37 1/8
Inside Width (Inches)	16	20 1/4	18	20 3/4	23	23	26	20 3/4	23	23	20 3/4	23	26	33 1/2	42 1/2
Inside Depth (Inches)	16	15 7/8	14 11/16	16	16	16 1/2	16 1/2	16	16	16 1/2	16	16	16 1/2	19 1/2	19 1/2
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Insulation	← Thermocraft →														
ICE TRAYS															
Total Number of Trays	2	2	2	3	4	6	6	3	4	4	3	4	6	7	7
Total Weight of Ice (Lbs.)	2	5	5	6	8	12	12	6	8	8	6	8	12	22	22
Total Number of Cubes	20	40	40	60	80	120	120	60	80	80	60	80	120	120	120
Number of Trays/Lbs. Each	2–1	2–2.5	2–2.5	3–2	4–2	6–2	6–2	3–2	4–2	4–2	3–2	4–2	6–2	6–2	6–2
Material of Above	← Aluminum →														
Number of Trays/Lbs. Each	....	....	....	....	....	....	....	....	....	....	....	....	....	1–10	1–10
Material of Above														← Aluminum →	
Number of Special Trays	....	....	....	2	4	6	6	....	....	2	2	4	6	6	6
COMPRESSOR															
Location	← Below →														
Open or Sealed	← Hermetically Sealed →														
Reciprocating or Rotary	← Reciprocating →														
Refrigerant Used	← Sulphur Dioxide →												← Freon-12 →		
CONDENSER															
Type	← Plate Type →												← Finned Tube →		
How Cooled	Natural Draft	Fan	← Natural Draft →										← Fan →		
WEIGHT (COMPLETE REFRIGERATOR)															
Net Weight (Lbs.)	130	178	210	272	310	345	364	245	300	347	275	315	375	660	760
Shipping Weight (Lbs.)	160	212	260	325	370	430	470	315	360	420	330	380	480	762	862
GUARANTEE															
Cabinet, Shelves, Trays and Accessories	← 1 Year →														
Refrigeration System Only	← 1 Year Plus Additional 4 Year Replacement Contract →														
Controls	← 1 Year →														

GIBSON

Name of Manufacturer	Gibson Electric Refrigerator Corporation, Greenville, Mich.												
Model No.	S-48	S-58	S-68	S-78	S-638	CB-588	CB-698	CB-798	CB-868	PCB-588	PCB-698	PCB-798	PCB-868
Exterior Cabinet Finish	← Dulux →									← Porcelain →			
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)													
Net Food Storage (Cu. Ft.)	4.00	5.00	6.00	7.00	5.60	5.00	6.00	7.00	7.75	5.00	6.00	7.00	7.75
Total Shelf Area (Sq. Ft.)	8.6	10.48	11.48	14.8	11.3	10.3	12.8	13.4	14.65	10.3	12.8	13.4	14.65
CABINET													
Interior Finish	← Porcelain →												
Overall Height (Inches)	$50\frac{1}{2}$	54	$57\frac{7}{8}$	$61\frac{1}{4}$	$55\frac{3}{4}$	54	$57\frac{7}{8}$	$61\frac{1}{4}$	$61\frac{1}{4}$	54	$57\frac{7}{8}$	$61\frac{1}{4}$	$61\frac{1}{4}$
Overall Width (Inches)	24	$28\frac{5}{8}$	30	$30\frac{1}{2}$	$29\frac{5}{8}$	$28\frac{5}{8}$	30	$30\frac{1}{2}$	$33\frac{7}{8}$	$28\frac{5}{8}$	30	$30\frac{1}{2}$	$33\frac{7}{8}$
Overall Depth (Inches)	$21\frac{13}{16}$	$24\frac{1}{2}$	26	$26\frac{3}{4}$	26	$24\frac{1}{2}$	26	$26\frac{3}{4}$	$26\frac{3}{4}$	$24\frac{1}{2}$	26	$26\frac{3}{4}$	$26\frac{3}{4}$
Inside Height (Inches)	$26\frac{1}{2}$	$28\frac{15}{16}$	$31\frac{5}{16}$	$34\frac{11}{16}$	$29\frac{7}{8}$	$28\frac{15}{16}$	$31\frac{5}{16}$	$34\frac{11}{16}$	$34\frac{5}{16}$	$28\frac{15}{16}$	$31\frac{5}{16}$	$34\frac{11}{16}$	$34\frac{5}{16}$
Inside Width (Inches)	$19\frac{5}{8}$	23	$23\frac{5}{8}$	$23\frac{1}{4}$	23	$15\frac{1}{16}$	$23\frac{5}{8}$	$23\frac{5}{8}$	27	23	$23\frac{5}{8}$	$23\frac{5}{8}$	27
Inside Depth (Inches)	$14\frac{13}{16}$	$15\frac{1}{16}$	$16\frac{1}{16}$	$16\frac{13}{16}$	$16\frac{1}{16}$	$15\frac{1}{16}$	$16\frac{1}{16}$	$16\frac{13}{16}$	$16\frac{1}{16}$	$15\frac{1}{16}$	$16\frac{1}{16}$	$16\frac{13}{16}$	$16\frac{1}{16}$
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1
Insulation	← Balsam Wool →												
ICE TRAYS													
Total Number of Trays	3	4	5	5	4	4	5	5	5	4	5	5	5
Total Weight of Ice (Lbs.)	4.5	6.5	10.5	11.5	8	6.5	10.5	11.5	11.5	6.5	10.5	11.5	11.5
Total Number of Cubes	63	77	97	97	84	70	97	97	97	70	97	97	97
Number of Trays/Lbs. Each	$3\text{-}1\frac{1}{2}$	$2\text{-}1\frac{1}{2}$	2-2	1-2	4-2	$1\text{-}1\frac{1}{2}$	2-2	1-2	1-2	$1\text{-}1\frac{1}{2}$	2-2	1-2	1-2
Material of Above	← Aluminum →												
Number of Trays/Lbs. Each	....	$1\text{-}1\frac{1}{2}$	1-2	1-2	....	$1\text{-}1\frac{1}{2}$	1-2	1-2	1-2	$1\text{-}1\frac{1}{2}$	1-2	1-2	1-2
Material of Above	← Aluminum—Presto Rubber Grids →												
Number of Trays/Lbs. Each	....	1-2	1-3	2-3	....	1-2	1-3	2-3	2-3	1-2	1-3	2-3	2-3
Material of Above	← Aluminum →												
Number of Trays/Lbs. Each	....	....	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	....	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$	$1\text{-}1\frac{1}{2}$
Material of Above	← Aluminum →												
COMPRESSOR													
Location	← Below →												
Open or Sealed	← Sealed →												
Reciprocating or Rotary	← Reciprocating →												
Refrigerant Used	Freon-12 ← Sulphur Dioxide →				Freon-12	← Sulphur Dioxide →							
CONDENSER													
Type	← Finned Coil →												
How Cooled	← Forced Draft →												
WEIGHT (COMPLETE REFRIGERATOR)													
Net Weight (Lbs.)	233	293	321	343	286	310	343	355	387	327	360	379	411
Shipping Weight (Lbs.)	279	353	384	412	354	367	403	427	464	389	428	454	499
GUARANTEE													
Cabinet, Shelves, Trays and Accessories	← 1 Year →												
Refrigeration System Only	← 1 Year, with 4 Year Motor-Compressor Contract →												
Controls	← 1 Year →												

HOTPOINT

Name of Manufacturer	Edison General Electric Appliance Co., Chicago, Ill.														
Model No.	LK-2	120EB32	120EB52	120EB62	120EB72	120EC42	120EC52	120EC62	120EC72	120EC82	110ED52	110ED62	110ED82	110ED122	110ED162
Exterior Cabinet Finish	← Glyptal →										← Porcelain →				
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)															
Net Food Storage (Cu. Ft.)	2.0	2.8	5.0	6.1	7.1	4.0	5.0	6.1	7.1	8.1	5.0	6.1	8.1	12.0	16.1
Total Shelf Area (Sq. Ft.)	....	6.9	10.6	12.2	15.1	9.3	10.6	12.2	15.1	16.9	10.6	12.2	16.9	26.3	32.3
CABINET															
Interior Finish	← Porcelain →														
Overall Height (Inches)	36	36	$53\frac{3}{16}$	$56\frac{1}{2}$	60	$49\frac{9}{16}$	$53\frac{9}{16}$	$56\frac{1}{2}$	60	60	$53\frac{9}{16}$	$56\frac{1}{2}$	60	$67\frac{3}{16}$	$67\frac{3}{16}$
Overall Width (Inches)	21	$23\frac{3}{4}$	$27\frac{3}{4}$	30	30	24	$27\frac{3}{4}$	30	30	33	$27\frac{3}{4}$	30	33	40	49
Overall Depth (Inches)	$23\frac{7}{8}$	$23\frac{1}{4}$	$26\frac{7}{8}$	$26\frac{5}{8}$	$27\frac{1}{8}$	$25\frac{3}{8}$	$26\frac{7}{8}$	$26\frac{5}{8}$	$27\frac{1}{8}$	$28\frac{1}{4}$	$26\frac{7}{8}$	$26\frac{5}{8}$	$28\frac{1}{4}$	$31\frac{9}{16}$	$31\frac{9}{16}$
Inside Height (Inches)	$13\frac{1}{4}$	$17\frac{1}{16}$	$28\frac{1}{2}$	$32\frac{7}{16}$	$35\frac{15}{16}$	$28\frac{1}{2}$	$28\frac{1}{2}$	$32\frac{7}{16}$	$35\frac{15}{16}$	$35\frac{15}{16}$	$28\frac{1}{2}$	$32\frac{7}{16}$	$35\frac{15}{16}$	$37\frac{1}{8}$	$37\frac{1}{8}$
Inside Width (Inches)	16	$20\frac{1}{4}$	$20\frac{3}{4}$	23	23	18	$20\frac{3}{4}$	23	23	26	$20\frac{3}{4}$	23	26	$33\frac{1}{2}$	$42\frac{1}{2}$
Inside Depth (Inches)	16	$15\frac{7}{8}$	16	16	$16\frac{1}{2}$	$14\frac{11}{16}$	16	16	$16\frac{1}{2}$	$16\frac{1}{2}$	16	16	$16\frac{1}{2}$	$19\frac{1}{2}$	$19\frac{1}{2}$
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Insulation	← Thermocraft →														
ICE TRAYS															
Total Number of Trays	2	2	3	4	4	2	3	4	6	6	3	4	6	7	7
Total Weight of Ice (Lbs.)	2	5	6	8	8	5	6	8	12	12	6	8	12	22	22
Total Number of Cubes	20	40	60	80	80	40	60	80	120	120	60	80	120	120	120
Number of Trays/Lbs. Each	2/1	2/2.5	3/2	4/2	4/2	2/2.5	3/2	4/2	6/2	6/2	3/2	4/2	6/2	6/2	6/2
Material of Above	← Aluminum →														
Number of Trays/Lbs. Each	....	....	....	....	....	....	....	....	....	....	....	....	....	1-10	1-10
Material of Above	....	....	....	....	....	....	....	....	....	....	....	....	....	← Aluminum →	
Number of Special Trays	....	....	....	....	2	....	2	4	6	6	2	4	6	6	6
COMPRESSOR															
Location	← Below →														
Open or Sealed	← Hermetically Sealed →														
Reciprocating or Rotary	← Reciprocating →														
Refrigerant Used	← Sulphur Dioxide →													← Freon-12 →	
CONDENSER															
Type	← Plate Type →					← Finned Tube →									
How Cooled	Natural Draft ← Fan →														
WEIGHT (COMPLETE REFRIGERATOR)															
Net Weight (Lbs.)	130	178	245	300	347	210	272	310	345	364	275	315	375	660	760
Shipping Weight (Lbs.)	160	212	315	360	420	260	325	370	430	470	330	380	480	762	862
GUARANTEE															
Cabinet, Shelves, Trays and Accessories	← 1 Year →														
Refrigeration System Only	← 1 Year Plus Additional 4 Year Replacement Contract →														
Controls	← 1 Year →														

KELVINATOR

Name of Manufacturer: Kelvinator Division, Nash-Kelvinator Corp., Detroit, Mich.

Model No.	KS5-38	KS6-38	KS7-38	K3-38	K4-38	K5-38	K6-38	K7-38	PK5-38	PK6-38	PK7-38	SD7-38	SD9-38	SD13-38	SD17-38
Exterior Cabinet Finish	← Permalux →								← Porcelain →						
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)															
Net Food Storage (Cu. Ft.)	5.12	6.09	7.13	3.14	4.10	5.12	6.09	7.13	5.12	6.09	7.13	7.04	9.20	13.12	16.79
Total Shelf Area (Sq. Ft.)	10.72	14.03	15.49	7.48	9.67	10.72	14.03	15.49	10.72	14.03	15.49	13.80	18.51	25.92	31.86
CABINET															
Interior Finish	← Porcelain →														
Overall Height (Inches)	58	60	63 1/4	48	51 3/16	58 1/2	60 13/16	64 5/32	58 3/4	61 1/16	64 15/32	61 3/16	66 11/16	66 23/32	73 23/32
Overall Width (Inches)	29 1/4	31 7/16	32 7/8	24	24	29 7/8	32 1/16	33 1/2	29 7/8	32 1/16	33 1/2	32 1/16	34 1/2	48	50 3/16
Overall Depth (Inches)	25 3/32	25 3/32	25 3/32	26 1/4	26 13/16	25 5/16	25 5/16	25 5/16	25 7/32	25 7/32	25 7/32	28 23/32	28 23/32	28 31/32	28 31/32
Inside Height (Inches)	30 3/16	32 3/16	35 7/16	19 1/2	24 1/4	30 3/16	32 3/16	35 7/16	30 3/16	32 3/16	35 7/16	24 13/16	30	35 1/2	42 1/2
Inside Width (Inches)	22 1/8	24 5/16	25 3/4	18 7/16	18 7/16	22 1/8	24 5/16	25 3/4	22 1/8	24 5/16	25 3/4	24 5/16	26 3/4	27 3/8	29 9/16
Inside Depth (Inches)	14 1/32	14 1/32	14 1/32	16 9/32	16 9/32	14 1/32	14 1/32	14 1/32	14 1/32	14 1/32	14 1/32	17 29/32	17 29/32	18 25/32	18 25/32
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Insulation	← Kelvatex →														
ICE TRAYS															
Total Number of Trays	4	4	6	2	2	4	4	6	4	4	6	6	6	10	12
Total Weight of Ice (Lbs.)	8	8	12	4	4	8	8	12	8	8	12	21	23 1/2	26	30 1/2
Total Number of Cubes	80	80	120	40	40	80	80	120	80	80	120	176	187	240	280
Number of Trays/Lbs. Each	2-2	2-2	3-2	1-2	1-2	2-2	2-2	3-2	2-2	2-2	3-2	....	....	....	....
Material of Above	← Aluminum with Speedy Cube Release →														
Number of Trays/Lbs. Each	2-2	2-2	3-2	1-2	1-2	2-2	2-2	3-2	2-2	2-2	3-2	2-2 1/4 2-6	1-2 1/4 1-3 1/2 2-6	4-2 1/4 2-4	5-2 1/4 2-4
Material of Above	← Aluminum with Rubber Grids →														
Number of Trays/Lbs. Each	....	....	....	....	....	....	....	....	....	....	....	2-2 1/4	1-2 1/4 1-3 1/2	4-2 1/4	5-2 1/4
Material of Above	....	....	....	....	....	....	....	....	....	....	....	← All Rubber →			
COMPRESSOR															
Location	← Below →														
Open or Sealed	← Sealed →											← Open →			
Reciprocating or Rotary	← Reciprocating →														
Refrigerant Used	← Freon →											← Sulphur Dioxide →			
CONDENSER															
Type	← Cellular →														
How Cooled	← Air →														
WEIGHT (COMPLETE REFRIGERATOR)															
Net Weight (Lbs.)	261	291	302	216	234	271	310	322	334 1/2	361 1/2	384 1/2	442	497	674	745
Shipping Weight (Lbs.)	339	375	403	268	294	353	393	417	424	459	498	524	628	887	986
GUARANTEE															
Cabinet, Shelves, Trays and Accessories	← 1 Year →														
Refrigeration System Only	← 1 Year-5 Year Service Plan →														
Controls	← 1 Year →														

LEONARD

Name of Manufacturer	Leonard Division, Nash-Kelvinator Corp., Detroit, Mich.										
Model No.	LS5-38	LS6-38	LS7-38	L3-38	L4-38	L5-38	L6-38	L7-38	P5-38	P6-38	P7-38
Exterior Cabinet Finish	Permalain								Porcelain		
Retail Installed Price	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
CAPACITY (NEMA Rating)											
Net Food Storage (Cu. Ft.)	5.12	6.09	7.13	3.14	4.10	5.12	6.09	7.13	5.12	6.09	7.13
Total Shelf Area (Sq. Ft.)	10.72	14.03	15.49	7.48	9.67	10.72	14.03	15.49	10.72	14.03	15.49
CABINET											
Interior Finish	Porcelain										
Overall Height (Inches)	$59\frac{3}{4}$	$61\frac{3}{4}$	65	48	$51\frac{3}{16}$	$60\frac{3}{4}$	$62\frac{3}{8}$	$65\frac{5}{8}$	$60\frac{3}{4}$	$62\frac{3}{8}$	$65\frac{5}{8}$
Overall Width (Inches)	$29\frac{1}{4}$	$31\frac{7}{16}$	$32\frac{7}{8}$	24	24	$29\frac{7}{8}$	$32\frac{1}{16}$	$33\frac{1}{2}$	$29\frac{7}{8}$	$32\frac{1}{16}$	$33\frac{1}{2}$
Overall Depth (Inches)	$24\frac{19}{32}$	$24\frac{19}{32}$	$24\frac{19}{32}$	$25\frac{3}{4}$	$25\frac{3}{4}$	$25\frac{1}{4}$	$25\frac{1}{4}$	$25\frac{1}{4}$	$25\frac{5}{32}$	$25\frac{5}{32}$	$25\frac{5}{32}$
Inside Height (Inches)	$30\frac{3}{16}$	$32\frac{3}{16}$	$35\frac{7}{16}$	$19\frac{1}{2}$	$24\frac{1}{4}$	$30\frac{3}{16}$	$32\frac{3}{16}$	$35\frac{7}{16}$	$30\frac{3}{16}$	$32\frac{3}{16}$	$35\frac{7}{16}$
Inside Width (Inches)	$22\frac{1}{8}$	$24\frac{5}{16}$	$25\frac{3}{4}$	$18\frac{7}{16}$	$18\frac{7}{16}$	$22\frac{1}{8}$	$24\frac{5}{16}$	$25\frac{3}{4}$	$22\frac{1}{8}$	$24\frac{5}{16}$	$25\frac{3}{4}$
Inside Depth (Inches)	$14\frac{1}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$	$16\frac{9}{32}$	$16\frac{9}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$	$14\frac{1}{32}$
Number of Doors	1	1	1	1	1	1	1	1	1	1	1
Insulation	Leonard Approved										
ICE TRAYS											
Total Number of Trays	4	4	6	2	2	4	4	6	4	4	6
Total Weight of Ice (Lbs.)	8	8	12	4	4	8	8	12	8	8	12
Total Number of Cubes	80	80	120	40	40	80	80	120	80	80	120
Number of Trays/Lbs. Each	2-2	2-2	3-2	1-2	1-2	2-2	2-2	3-2	2-2	2-2	3-2
Material of Above	Aluminum with Ice Popper Release										
Number of Trays/Lbs. Each	2-2	2-2	3-2	1-2	1-2	2-2	2-2	3-2	2-2	2-2	3-2
Material of Above	Aluminum with Rubber Grids										
COMPRESSOR											
Location	Above										
Open or Sealed	Sealed										
Reciprocating or Rotary	Reciprocating										
Refrigerant Used	Freon										
CONDENSER											
Type	Cellular										
How Cooled	Air										
WEIGHT (COMPLETE REFRIGERATOR)											
Net Weight (Lbs.)	280	295	319	217	237	303	333	351	$353\frac{1}{2}$	$382\frac{1}{2}$	$400\frac{1}{2}$
Shipping Weight (Lbs.)	352	376	397	276	298	379	406	426	427	453	480
GUARANTEE											
Cabinet, Shelves, Trays and Accessories	1 Year										
Refrigeration System Only	1 Year-5 Year Service Plan										
Controls	1 Year										

NORGE

	R-32-8	R-41-8	R-42-8	R-51-8	R-61-8	R-71-8	R-81-8	R-130-8	P-42-8	P-51-8	P-61-8	P-71-8	P-81-8	LTP-81-8	LTP-123-8	S-52-8	S-62-8	S-71-8	GR-75-8	A-31-8
Name of Manufacturer	Norge Division, Borg-Warner Corp., Detroit, Mich.																			
Model No.																				
Exterior Cabinet Finish	Norgloss							Porcelain								Norgloss				
Retail Installed Price																				
CAPACITY (NEMA Rating)																				
Net Food Storage (Cu. Ft.)	3.16	4.14	4.17	5.12	6.14	7.09	8.11	13.12	4.17	5.12	6.14	7.09	8.11	8.08	12.25	5.15	6.15	7.14	7.54	3.10
Total Shelf Area (Sq. Ft.)	7.45	9.31	9.41	12.06	13.31	15.40	16.84	29.49	9.41	12.06	13.31	15.40	16.84	17.17	28.50	11.92	13.56	16.41	14.03	6.92
CABINET																				
Interior Finish	Porcelain																			
Overall Height (Inches)	49 9/16	52 3/4	53 1/8	57 7/8	60	63 1/8	65 1/4	64 1/2	53 1/8	57 7/8	60	63 1/8	65 1/4	64 1/2	64 1/2	54 13/16	57 13/16	58 7/8	64 1/2	36
Overall Width (Inches)	24 3/16	24 3/16	27 1/8	29 3/8	31 5/8	33 1/8	35 5/8	50 1/4	27 1/8	29 3/8	31 5/8	33 1/8	35 5/8	34 15/16	50 1/4	27 11/16	30 13/16	33 11/16	34 15/16	24
Overall Depth (Inches)	21 3/4	21 3/4	23 7/16	23 3/16	23 3/16	23 3/16	23 3/16	28 1/16	23 7/16	23 3/16	23 3/16	23 3/16	23 3/16	27 3/4	28 1/16	22	22 3/4	22 3/4	27 3/4	23 1/4
Inside Height (Inches)	21 5/8	27 13/16	25 3/8	29 5/8	31 3/4	34 3/8	35 1/2	34	25 3/8	29 5/8	31 3/4	34 3/8	35 1/2	34	34	29 5/8	31 5/8	32 11/16	34	17 3/16
Inside Width (Inches)	19	19	19 1/2	21 3/4	24	25 1/2	28	41 1/8	19 1/2	21 3/4	24	25 1/2	28	25 13/16	41 1/8	22	24 1/8	27	25 13/16	20 1/2
Inside Depth (Inches)	15	15	16 1/4	15	15	15	15	18 5/16	16 1/4	15	15	15	15	18 5/16	18 5/16	15	15	15	18 5/16	17 7/16
Number of Doors	1	1	1	1	1	1	1	2	1	1	1	1	1	1	2	1	1	1	1	1
Insulation	Norge Approved																			
ICE TRAYS																				
Total Number of Trays	2	3	3	4	4	5	5	8	3	4	4	5	5	4	6	4	4	5	4	2
Total Weight of Ice (Lbs.)	4 1/2	7	7	9 1/2	9 1/2	12	12	19 1/2	7	9 1/2	9 1/2	12	12	14 1/2	23 1/2	9 1/2	9 1/2	12	12	5
Total Number of Cubes	42	63	61	81	81	101	101	161	61	81	81	101	101	120	192	84	84	105	96	42
Number of Trays/Lbs. Each	1-2 1/2	2-2 1/2												1-6	2-6	3-2 1/2	3-2 1/2	4-2 1/2	4-3	2-2 1/2
Material of Above	Aluminum																			
Number of Trays/Lbs. Each			2-2 1/2	3-2 1/2	3-2 1/2	4-2 1/2	4-2 1/2	7-2 1/2	2-2 1/2	3-2 1/2	3-2 1/2	4-2 1/2	4-2 1/2	2-3	3-3					
Material of Above	Aluminum with Rubber Grid																			
Number of Trays/Lbs. Each	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2 1/2	1-2 1/2	1-2	1-2	1-2		
Material of Above	Rubber																			
COMPRESSOR																				
Location	Below																			
Open or Sealed	Open																			
Reciprocating or Rotary	Rotary																			
Refrigerant Used	Sulphur Dioxide																			
CONDENSER																				
Type	Fin and Tube																			
How Cooled	Forced Draft																			
WEIGHT (COMPLETE REFRIGERATOR)																				
*Net Weight (Lbs.)	218	237	278	305	316	345	371	590	303	335	339	350	459	483	610	282	317	349	446	211
*Shipping Weight (Lbs.)	269	288	350	375	390	426	457	740	375	406	410	431	531	562	760	347	399	439	518	266
GUARANTEE																				
Cabinet, Shelves, Trays and Accessories	1 Year Warranty																			
Refrigeration System Only	5 Year Warranty																			
Controls	1 Year Warranty																			
Rollator Compressor	10 Year Warranty																			

*Approximate.

POTTER

Name of Manufacturer	Potter Refrigerator Corp., Buffalo, N. Y.							
Model No.	SL-860	SL-870		SD-810		SD-813		SD-815
Exterior Cabinet Finish	Dulux							
Retail Installed Price	.....	.....		.....		.....		.....
CAPACITY (NEMA Rating)								
Net Food Storage (Cu. Ft.)	.....	.....		.....		.....		.....
Total Shelf Area (Sq. Ft.)	12.66	15.34		10.3		13.0		15.1
CABINET								
Interior Finish	Porcelain							
Overall Height (Inches)	58	60 1/2		58		63 1/4		65 1/2
Overall Width (Inches)	30 1/2	30 1/2		30 1/2		30 1/2		34 1/2
Overall Depth (Inches)	23 1/2	23 1/2		25		25		25 3/4
			General Storage	Frozen Storage	General Storage	Frozen Storage	General Storage	Frozen Storage
Inside Height (Inches)	30 1/2	34 1/2	16 3/4	10 1/2	22 1/4	10 1/2	22 1/4	10 1/2
Inside Width (Inches)	24	24	24	20	24	20	28	24
Inside Depth (Inches)	15 3/4	16 1/4	16 1/4	15 1/4	16 1/4	15 1/4	16 1/4	15 1/4
Number of Doors	1	1		2		2		2
Insulation	Balcelite							
ICE TRAYS								
Total Number of Trays	5	7	4	.....	4	.....	5	.....
Total Weight of Ice (Lbs.)	10.2	13.6	6.8	30	6.8	30	8.5	50
Total Number of Cubes	126	168	84	.....	84	.....	105	.....
Number of Trays/Lbs. Each	2-1.7	2-1.7	4-1.7	.....	4-1.7	.....	5-1.7	.....
Material of Above	Aluminum with Rubber Grids							
Number of Trays/Lbs. Each	1-3.4	1-3.4						
Material of Above	Aluminum							
Number of Trays/Lbs. Each	2-1.7	4-1.7						
Material of Above	Aluminum							
COMPRESSOR								
Location	Below							
Open or Sealed	Open							
Reciprocating or Rotary	Reciprocating							
Refrigerant Used	Freon							
CONDENSER								
Type	Finned Tube							
How Cooled	Fan							
WEIGHT (COMPLETE REFRIGERATOR)								
Net Weight (Lbs.)	.....	.....	.....	.....	.....	.....	.....	.....
Shipping Weight (Lbs.)	.....	.....	.....	.....	.....	.....	.....	.....
GUARANTEE								
Cabinet, Shelves, Trays and Accessories	1 Year							
Refrigeration System Only	1 Year							
Controls	1 Year							

STEWART-WARNER

Name of Manufacturer	Stewart-Warner Corporation, Chicago, Ill.											
Model No.	358	458	558	658	568	668	768	566-P	668-P	768-P	550	770
Exterior Cabinet Finish	← Dulux →							← Porcelain →			← Dulux →	
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)												
Net Food Storage (Cu. Ft.)	3.1	4.5	5.5	6.3	5.5	6.3	7.5	5.5	6.3	7.5	5.64	6.3
Total Shelf Area (Sq. Ft.)	6.2	10.5	11.8	14.2	13.2	14.4	16.8	13.2	14.4	16.8	11.0	13.6
CABINET												
Interior Finish	← Porcelain →											
Overall Height (Inches)	$41\frac{13}{16}$	51	$55\frac{7}{8}$	$59\frac{3}{4}$	$55\frac{7}{8}$	$59\frac{3}{4}$	63	$55\frac{7}{8}$	$59\frac{3}{4}$	63	$55\frac{3}{16}$	$58\frac{7}{16}$
Overall Width (Inches)	$23\frac{7}{8}$	$23\frac{7}{8}$	30	30	30	30	$33\frac{3}{4}$	30	30	$33\frac{3}{4}$	$28\frac{3}{4}$	$28\frac{3}{4}$
Overall Depth (Inches)	$24\frac{1}{8}$	$24\frac{1}{8}$	$23\frac{9}{16}$	$23\frac{9}{16}$	$23\frac{1}{2}$	$23\frac{1}{2}$	$24\frac{1}{2}$	$23\frac{1}{2}$	$23\frac{1}{2}$	$24\frac{1}{2}$	$23\frac{5}{16}$	$23\frac{5}{16}$
Inside Height (Inches)	$17\frac{3}{4}$	$26\frac{1}{2}$	$30\frac{1}{8}$	34	$30\frac{1}{8}$	34	$36\frac{1}{4}$	$30\frac{1}{8}$	34	$36\frac{1}{4}$	29	$32\frac{1}{4}$
Inside Width (Inches)	20	$19\frac{1}{2}$	$23\frac{3}{4}$	$23\frac{3}{4}$	$23\frac{3}{4}$	$23\frac{3}{4}$	$26\frac{1}{2}$	$23\frac{3}{4}$	$23\frac{3}{4}$	$26\frac{1}{2}$	$22\frac{1}{2}$	$22\frac{1}{2}$
Inside Depth (Inches)	$16\frac{7}{8}$	$16\frac{1}{2}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$14\frac{3}{4}$	$16\frac{3}{4}$	$16\frac{3}{4}$
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1
Insulation	← Glass Wool →										← Balsam Wool →	
ICE TRAYS												
Total Number of Trays	2	2	4	4	4	4	6	4	4	6	4	4
Total Weight of Ice (Lbs.)	4	4	8	8	$7\frac{3}{4}$	$7\frac{3}{4}$	$11\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$11\frac{3}{4}$	8	8
Total Number of Cubes	56	56	96	96	88	88	136	88	88	136	96	96
Number of Trays/Lbs. Each	2.2	2.2	4.2	4.2	3.2	3.2	5.2	3.2	3.2	5.2	4.2	4.2
Material of Above	← Aluminum →											
Number of Trays/Lbs. Each	....	....	....	....	$1\text{-}1\frac{3}{4}$	$1\text{-}1\frac{3}{4}$	$1\text{-}1\frac{3}{4}$	$1\text{-}1\frac{3}{4}$	$1\text{-}1\frac{3}{4}$	$1\text{-}1\frac{3}{4}$	....	....
Material of Above	....	....	....	....	← Aluminum →						....	....
Instant Cube Tray	....	....	....	....	1	1	1	1	1	1	....	....
COMPRESSOR												
Location	← Below →											
Open or Sealed	← Open →											
Reciprocating or Rotary	← Reciprocating →											
Refrigerant Used	← Sulphur Dioxide →											
CONDENSER												
Type	← Finned →											
How Cooled	← Air (Fan) →											
WEIGHT (COMPLETE REFRIGERATOR)												
Net Weight (Lbs.)	236	250	324	337	340	358	405	354	372	428	333	346
Shipping Weight (Lbs.)	270	308	388	402	400	420	478	415	433	498	389	405
GUARANTEE												
Cabinet, Shelves, Trays and Accessories	← 1 Year →											
Refrigeration System	← 1 Year—Additional 4 Years Protection Policy →											
Controls	← 1 Year →											

UNIVERSAL COOLER

	AD-538	AD-658	AD-758	BD-538	BD-658	BD-758	ADP-658	BDP-658	CL-408	CL-528	CL-628
Name of Manufacturer	Universal Cooler Corporation, Detroit, Mich.										
Model No.											
Exterior Cabinet Finish	← Ucoluxe →						← Porcelain →		← Ucoluxe →		
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)											
Net Food Storage (Cu. Ft.)	5.25	6.51	7.45	5.25	6.51	7.45	6.51	6.51	4.01	5.17	6.23
Total Shelf Area (Sq. Ft.)	12.20	14.20	16.20	12.20	14.20	16.20	14.20	14.20	8.20	12.20	12.97
CABINET											
Interior Finish	← Porcelain →										
Overall Height (Inches)	56	$59\frac{15}{16}$	$64\frac{1}{4}$	56	$59\frac{15}{16}$	$64\frac{1}{4}$	$60\frac{7}{16}$	$60\frac{7}{16}$	$50\frac{7}{16}$	$54\frac{3}{8}$	$57\frac{1}{8}$
Overall Width (Inches)	$27\frac{5}{8}$	$30\frac{1}{4}$	$30\frac{1}{4}$	$27\frac{5}{8}$	$30\frac{1}{4}$	$30\frac{1}{4}$	$30\frac{1}{4}$	$30\frac{1}{4}$	24	$27\frac{5}{8}$	$29\frac{1}{8}$
Overall Depth (Inches)	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$25\frac{23}{32}$	$24\frac{17}{32}$	$25\frac{17}{32}$	$25\frac{17}{32}$
Inside Height (Inches)	$27\frac{7}{16}$	$29\frac{7}{16}$	$33\frac{3}{4}$	$27\frac{7}{16}$	$29\frac{7}{16}$	$33\frac{3}{4}$	$29\frac{7}{16}$	$29\frac{7}{16}$	$24\frac{1}{4}$	$27\frac{7}{16}$	$30\frac{3}{16}$
Inside Width (Inches)	$20\frac{5}{8}$	$23\frac{5}{8}$	$23\frac{5}{8}$	$20\frac{5}{8}$	$23\frac{5}{8}$	$23\frac{5}{8}$	$23\frac{5}{8}$	$23\frac{5}{8}$	$18\frac{7}{16}$	$20\frac{5}{8}$	$22\frac{1}{8}$
Inside Depth (Inches)	← 17 →										
Number of Doors	← One →										
Insulation	← Thermocraft →										
ICE TRAYS											
Total Number of Trays	4	4	5	4	4	5	4	4	3	3	3
Total Weight of Ice (Lbs.)	$8\frac{1}{2}$	$8\frac{1}{2}$	$11\frac{5}{8}$	9	9	$12\frac{1}{8}$	$8\frac{1}{2}$	9	$6\frac{3}{16}$	$9\frac{3}{8}$	$9\frac{3}{8}$
Total Number of Cubes	72	72	100	84	84	112	72	84	63	84	84
Number of Trays/Lbs. Each	$2\text{-}1\frac{3}{8}$	$2\text{-}1\frac{3}{8}$	$1\text{-}3\frac{1}{8}$	$2\text{-}3\frac{1}{8}$	$2\text{-}3\frac{1}{8}$	$3\text{-}3\frac{1}{8}$	$2\text{-}1\frac{3}{8}$	$2\text{-}3\frac{1}{8}$	$3\text{-}2\frac{1}{16}$	$3\text{-}3\frac{1}{8}$	$3\text{-}3\frac{1}{8}$
Material of Above	← Aluminum →										
Number of Trays/Lbs. Each	$2\text{-}2\frac{7}{8}$	$2\text{-}2\frac{7}{8}$	$2\text{-}2\frac{7}{8}$	....	....	$2\text{-}2\frac{7}{8}$	....	....	....	....	....
Material of Above	← Aluminum with Rubber Grids →										
Number of Trays/Lbs. Each	....	....	$2\text{-}1\frac{3}{8}$	$2\text{-}1\frac{3}{8}$	$2\text{-}1\frac{3}{8}$	$2\text{-}1\frac{3}{8}$	....	$2\text{-}1\frac{3}{8}$	....	....	....
Material of Above		← Aluminum →									
COMPRESSOR											
Location	← Below →										
Open or Sealed	← Open →										
Reciprocating or Rotary	← Reciprocating →										
Refrigerant Used	← Freon →										
CONDENSER											
Type	← Fin →										
How Cooled	← Forced Air →										
WEIGHT (COMPLETE REFRIGERATOR)											
Net Weight (Lbs.)	....	....	....	....	....	....	....	....	....	....	....
Shipping Weight (Lbs.)	337	365	390	312	345	368	420	404	270	304	323
GUARANTEE											
Cabinet, Shelves, Trays and Accessories	← 1 Year →										
Refrigeration System Only	← 1 Year—Additional Condensing Unit 4 Years Parts Protection Plan, No Extra Charge →										
Controls	← 1 Year →										

WESTINGHOUSE

Name of Manufacturer	Westinghouse Electric & Manufacturing Co., Mansfield, Ohio																					
Model No.	HU-30	HDS-32	HDS-42	HDS-52	HDS-62	HDS-72	HD-52	HD-62	HD-72	HD-95	HS-52	HS-62	HS-72	HPS-52	HPS-62	HPS-72	HP-62	HP-72	HP-95	FP-135	FP-200	
Exterior Cabinet Finish	◄ Dulux ►													◄ Porcelain ►								
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	
CAPACITY (NEMA Rating)																						
Net Food Storage (Cu. Ft.)	3 0	3 25	4 29	5 25	6 20	7 20	5 25	6 25	7 25	9 50	5 25	6 20	7 20	5 25	6 20	7 20	6 25	7 25	9 50	13 50	20 0	
Total Shelf Area (Sq. Ft.)	5 5	6 22	8 07	9 67	11 27	14 38	9 95	12 24	15 54	18 28	9 67	11 27	14 38	9 67	11 27	14 38	12 24	15 54	18 28	24 50	31 4	
CABINET																						
Interior Finish	◄ Porcelain ►																					
Overall Height (Inches)	$34\frac{1}{2}$	$46\frac{3}{4}$	$52\frac{1}{4}$	$55\frac{1}{16}$	$57\frac{15}{16}$	$60\frac{9}{16}$	$55\frac{5}{16}$	$57\frac{15}{16}$	$60\frac{9}{16}$	$64\frac{3}{16}$	$55\frac{5}{16}$	$57\frac{15}{16}$	$60\frac{9}{16}$	$55\frac{5}{16}$	$57\frac{15}{16}$	$60\frac{9}{16}$	$57\frac{15}{16}$	$60\frac{9}{16}$	$64\frac{3}{16}$	$58\frac{3}{4}$	$65\frac{1}{8}$	
Overall Width (Inches)	24	24	24	$27\frac{1}{8}$	$28\frac{5}{8}$	$29\frac{5}{8}$	$27\frac{1}{8}$	$28\frac{5}{8}$	$29\frac{5}{8}$	33	$27\frac{1}{8}$	$28\frac{5}{8}$	$29\frac{5}{8}$	$27\frac{1}{8}$	$28\frac{5}{8}$	$29\frac{5}{8}$	$28\frac{5}{8}$	$29\frac{5}{8}$	33	$53\frac{3}{8}$	$60\frac{1}{4}$	
Overall Depth (Inches)	24	$24\frac{1}{4}$	$24\frac{3}{4}$	$25\frac{7}{16}$	$26\frac{7}{16}$	$26\frac{7}{16}$	$25\frac{9}{16}$	$26\frac{9}{16}$	$26\frac{9}{16}$	$28\frac{3}{16}$	$25\frac{7}{16}$	$26\frac{7}{16}$	$26\frac{7}{16}$	$25\frac{7}{16}$	$26\frac{7}{16}$	$26\frac{7}{16}$	$26\frac{9}{16}$	$26\frac{9}{16}$	$28\frac{3}{16}$	$27\frac{1}{16}$	$28\frac{9}{16}$	
Inside Height (Inches)	18	$22\frac{1}{2}$	28	31	$33\frac{3}{8}$	36	31	$33\frac{3}{8}$	36	$38\frac{1}{2}$	31	$33\frac{3}{8}$	36	31	$33\frac{3}{8}$	36	$33\frac{3}{8}$	36	$38\frac{1}{2}$	$33\frac{3}{8}$	$38\frac{1}{2}$	
Inside Width (Inches)	$19\frac{1}{2}$	$18\frac{1}{4}$	$18\frac{1}{4}$	$20\frac{1}{4}$	$21\frac{3}{4}$	$23\frac{1}{4}$	$20\frac{1}{4}$	$21\frac{3}{4}$	$24\frac{1}{4}$	$25\frac{5}{8}$	$20\frac{1}{4}$	$21\frac{3}{4}$	$23\frac{1}{4}$	$20\frac{1}{4}$	$21\frac{3}{4}$	$23\frac{1}{4}$	$21\frac{3}{4}$	$24\frac{1}{4}$	$25\frac{5}{8}$	$46\frac{7}{8}$	$53\frac{3}{4}$	
Inside Depth (Inches)	$15\frac{1}{2}$	$14\frac{13}{32}$	$14\frac{13}{32}$	$14\frac{23}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$15\frac{21}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$17\frac{17}{32}$	$14\frac{23}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$14\frac{23}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$15\frac{5}{32}$	$17\frac{17}{32}$	$15\frac{5}{8}$	$16\frac{3}{8}$	
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	
Insulation	◄ Westinghouse Approved ►																					
ICE TRAYS																						
Total Number of Trays	2	2	2	3	5	5	3	5	5	5	3	5	5	3	5	5	5	5	5	6	10	
Total Weight of Ice (Lbs.)	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	9	$13\frac{1}{2}$	$13\frac{1}{2}$	9	13	13	13	9	$13\frac{1}{2}$	$13\frac{1}{2}$	9	$13\frac{1}{2}$	$13\frac{1}{2}$	13	13	13	15	24	
Total Number of Cubes	44	44	44	76	120	120	76	108	108	108	76	120	120	76	120	120	108	108	108	148	236	
Number of Trays/Lbs. Each	2 $2\frac{1}{4}$	2 $2\frac{1}{4}$	2 $2\frac{1}{4}$		2 $2\frac{1}{4}$	2 $2\frac{1}{4}$						2 $2\frac{1}{4}$	2 $2\frac{1}{4}$		2 $2\frac{1}{4}$	2 $2\frac{1}{4}$	....	....	....	2 $2\frac{1}{4}$	6 $2\frac{1}{4}$	
Material of Above	◄ (Standard) Aluminum ►																					
Number of Trays/Lbs. Each				1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	1 5	2 $3\frac{1}{4}$	2 $3\frac{1}{4}$	
Material of Above	◄ (Multi-Service) Aluminum ►																					
Number of Trays/Lbs. Each				2 2	2 2	2 2	2 2	4 2	4 2	4 2	2 2	2 2	2 2	2 2	2 2	2 2	4 2	4 2	4 2	2 2	2 2	
Material of Above	◄ (Eject-O-Cube) Aluminum ►																					
Number of Special Trays				3	3	3	3	5	5	5	3	3	3	3	3	3	5	5	5	4	4	
COMPRESSOR																						
Location	◄ Bottom Mounted ►																					
Open or Sealed	◄ Hermetically Sealed ►																					
Reciprocating or Rotary	◄ Vertical Reciprocating ►																					
Refrigerant Used	◄ Freon (F-12) ►																					
CONDENSER																						
Type	◄ Fin Tubed ►																					
How Cooled	◄ Force Draft, Air Cooled ►																					
WEIGHT (COMPLETE REFRIGERATOR)																						
Net Weight (Lbs.)	220	223	244	290	311	336	296	330	355	435	279	306	330	336	381	406	390	415	495	635	670	
Shipping Weight (Lbs.)	340	291	308	365	399	425	377	422	447	553	352	388	418	435	469	495	482	507	613	941	993	
GUARANTEE																						
Cabinet, Shelves, Trays and Accessories	◄ 1 Year ►																					
Refrigeration System Only	◄ 5 Years ►																					
Controls	◄ 1 Year ►																					

NEWS OF THE INDUSTRY

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Air Conditioning & Refrigeration News

Commercial Refrigerator Makers Agree on Trade-in Allowance

Buyers Jam Chicago Marts to Inspect New Appliance Lines

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WESTINGHOUSE

Name of Manufacturer: Westinghouse Electric & Manufacturing Co., Mansfield, Ohio

Model No.	HU-30	HDS-32	HDS-42	HDS-52	HDS-62	HDS-72	HD-52	HD-62	HD-72	HD-95	HS-52	HS-62	HS-72	HPS-52	HPS-62	HPS-72	HP-62	HP-72	HP-95	FP-135	FP-200
Exterior Cabinet Finish	← Dulux →													← Porcelain →							
Retail Installed Price	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
CAPACITY (NEMA Rating)																					
Net Food Storage (Cu. Ft.)	3.0	3.25	4.20	5.25	6.20	7.20	5.25	6.25	7.25	9.50	5.25	6.20	7.20	5.25	6.20	7.20	6.25	7.25	9.50	13.50	20.0
Total Shelf Area (Sq. Ft.)	5.5	6.22	8.07	9.67	11.27	14.38	9.95	12.24	15.54	18.28	9.67	11.27	14.38	9.67	11.27	14.38	12.24	15.54	18.28	24.50	31.4
CABINET																					
Interior Finish	← Porcelain →																				
Overall Height (Inches)	34½	46¾	52¼	55 5/16	57 5/16	60 9/16	55 5/16	57 5/16	60 9/16	64 9/16	55 7/16	57 5/16	60 9/16	55 5/16	57 5/16	60 9/16	57 5/16	60 9/16	64 9/16	58¾	65 1/8
Overall Width (Inches)	24	24	24	27 1/8	28 5/8	29 5/8	27 1/8	28 5/8	29 5/8	33	27 1/8	28 5/8	29 5/8	27 1/8	28 5/8	29 5/8	28 5/8	29 5/8	33	53 3/8	60¼
Overall Depth (Inches)	24	24¾	24¾	25 7/16	26 7/16	26 7/16	25 9/16	26 9/16	26 9/16	28 3/16	25 7/16	26 7/16	26 7/16	25 7/16	26 7/16	26 7/16	26 9/16	26 9/16	28 3/16	27 1/16	28 9/16
Inside Height (Inches)	18	22½	28	31	33 3/8	36	31	33 3/8	36	38½	31	33 3/8	36	31	33 3/8	36	33 3/8	36	38½	33 3/8	38½
Inside Width (Inches)	19½	18¼	18¼	20¼	21¾	23¼	20¼	21¾	24¼	25 5/8	20¼	21¾	23¼	20¼	21¾	23¼	21¾	24¼	25 5/8	46 7/8	53¾
Inside Depth (Inches)	15½	14 19/32	14 19/32	14 25/32	15 5/32	15 5/32	15 21/32	15 5/32	15 5/32	17 17/32	14 25/32	15 5/32	15 5/32	14 25/32	15 5/32	15 5/32	15 5/32	15 5/32	17 17/32	15 5/8	16 3/8
Number of Doors	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Insulation	← Westinghouse Approved →																				
ICE TRAYS																					
Total Number of Trays	2	2	2	3	5	5	3	5	5	5	3	5	5	3	5	5	5	5	5	6	10
Total Weight of Ice (Lbs.)	4½	4½	4½	9	13½	13½	9	13	13	13	9	13½	13½	9	13½	13½	13	13	13	15	24
Total Number of Cubes	44	44	44	76	120	120	76	108	108	108	76	120	120	76	120	120	108	108	108	148	236
Number of Trays/Lbs. Each	2-2¼	2-2¼	2-2¼	....	2-2¼	2-2¼	....	....	....	....	....	2-2¼	2-2¼	....	2-2¼	2-2¼	....	....	....	2-2¼	6-2¼
Material of Above	← (Standard) Aluminum →																				
Number of Trays/Lbs. Each	....	....	....	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	2-3¼	2-3¼
Material of Above	← (Multi-Service) Aluminum →																				
Number of Trays/Lbs. Each	....	....	....	2-2	2-2	2-2	2-2	4-2	4-2	4-2	2-2	2-2	2-2	2-2	2-2	2-2	4-2	4-2	4-2	2-2	2-2
Material of Above	← (Eject-O-Cube) Aluminum →																				
Number of Special Trays	....	....	....	3	3	3	3	5	5	5	3	3	3	3	3	3	5	5	5	4	4
COMPRESSOR																					
Location	← Bottom Mounted →																				
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E. E. McCray Dies; Helped to Pioneer Store Refrigerator

Curves Predominate In New Sears Line; Prices Are Higher

State of Virginia Puts Limit on Sales Terms

Who Pays Fee is Doubt as Chicago Code Is Approved

Executive Forecasts for 1938 To Appear in Next Issue

Dayton Sales Slumped a Horsetail Gain for Year

November ACMA Sales Show Slight Decrease

Kansas City '37 Sales 5% Below Past Year

West Penn Power Will Sponsor Co-op Plan as It Quits Merchandising

Five-Year Cumulative Record of Electric Refrigerator World Sales, Exports, Retirements and Market Saturation

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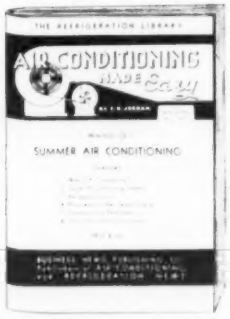
Air Conditioning Made Easy

A Complete Course of Study Covering All Phases of Air Conditioning

By F. O. Jordan



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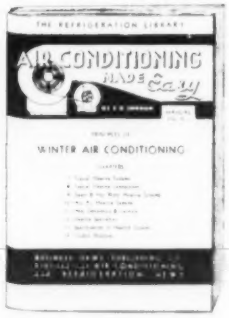

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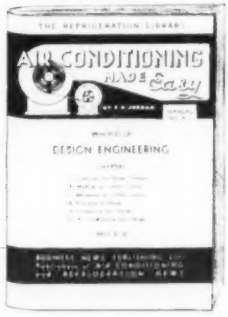

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These manuals provide a course of study covering all phases of air conditioning for contractors, architects, engineers, service men, and students. Written by F. O. Jordan, B.S.M.E., graduate of Purdue University, registered consulting engineer (Michigan), consulting engineer of the NEWS, and manager of Consultation Dept. of Refrigeration & Air Conditioning Institute of Chicago. Mr. Jordan has had long practical experience in the engineering departments of leading manufacturers. In this series of manuals he has collected and arranged the essential information from all the sciences (mathematics, physics, chemistry, thermodynamics, etc.) required by air-conditioning engineers and contractors.

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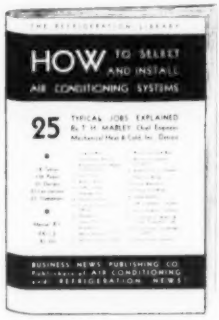

25 Typical Jobs Explained

1. Single Office
2. Conference Room
3. Residence with Room Conditioners
4. Shoe Store
5. Beauty Parlor
6. Coffee Shop
7. Process Job
8. Doctor's Suite
9. Central System for Offices
10. Residence
11. Upper Floor of Residence
12. Men's Apparel Store
13. Women's Dress Shop
14. Restaurant and Bar
15. Residence System Complete
16. Auditorium or Theater
17. Factory Wing
18. Store Basement
19. Group of Offices
20. Haberdashery
21. Office System, Indirect
22. Store System, Indirect
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24. Evaporative Condenser in System
25. Dehumidifier System

136 pages
$1.00 per copy

How to Select and Install Air Conditioning Systems

By T. H. Mabley

THIS is a series of 25 articles on AIR CONDITIONING, written by Mr. T. H. Mabley, chief engineer, Mechanical Heat & Cold, Inc., Detroit, Mich. These articles are "case histories" of installations engineered by Mr. Mabley in his regular work as chief engineer for a large Detroit air-conditioning contractor and distributor. They should be of real value to any individual who has any part in the estimating, engineering, and installation of air-conditioning equipment—also to prospective purchasers or users of air-conditioning equipment.

The "cases" start with the simpler installations such as a single office and continue on through to more complicated installations, such as process jobs and the air conditioning of auditoriums and department stores.

Simple methods are given for calculating heat gain and loss for each job, determining design conditions, selecting equipment, and locating and installing equipment. Direct and indirect systems are used in these typical installations and the advantages and disadvantages of each method are given.

While all the known fundamental functions of air conditioning are desirable, there are certain applications and conditions where some of the functions are not considered necessary nor economical to install and operate. High relative humidity, such as may be obtained with winter humidification might cause show windows in a store to cloud up, thus impairing the display. For such an application the summer functions are purchased, and winter humidification is omitted.

In a process job all of the functions may be utilized as the conditioning equipment is required to maintain predetermined year-around temperature and humidity within close limits.

Conditioning an auditorium where large crowds of people will be present for two or three hour periods has its particular problem while the design limits for a department store with its heavy electric light load require expert attention. All of these and other factors that must be considered are discussed for the individual application, and the selection of equipment is based upon the load calculations for predetermined design conditions.

The procedure followed on these 25 typical jobs may be studied by the contractor, dealer, engineer, etc., who is figuring a job and much valuable information may be gained that may save hours of time and possibly prevent expensive mistakes.

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